RAILROAD GAZETTE

FRIDAY, APRIL 22.

NEWS OF THE WEEK.

We give below, in a condensed form, the leading news items of the week. These items will be found in detail in their appropriate columns.

Elections.—Albemarle & Pantego, John L. Roper, President.—Central Transportation Co., Richard Muckle, President.—Columbus, Lima & Northwestern, B. C. Faurot, President.—Cleveland & Dayton, John W. Ferguson, President.—Cincinnati, Washington & Baltimore, Orland Smith, President.—Chicago Railroad Association, W. E. Davis, President.—Cincinnati, Wabash & Michigan, J. H. Wade, President.—Denver & Rio Grande, David H. Moffatt, President.—Denver, Texas & Fort Worth, Sidney Dillon, President.—East Carolina Land & Railway Co., C. E. Foy, President.—East Tennessee, Virginia & Georgia, E. B. Thomas, General Manager.—General Time Convention, H. S. Haines, President.—Grand Tower & Carbondale, J. D. Peters, Superintendent.—Interstate Commerce Commission, Edward A. Moseley, Secretary.—Kansas City Association of Railway Superintendents, J. O. Brinkerhoff, President.—Kanawha & Richmond, W. S. Edwards President.—Louisville & Nashville, R. S. Miner, Superintendent South & North Alabama Division.—Marquette, Houghton & Ontonagon, Andrew Watson, General Manager.—Paris, Marshall & Northwestern, John Martin, President.—United States Express, C. H. Crosby, General Manager.

Personal.—Died: F. M. Fonda; Alexander Mitchell.

New Compahies Organized.—Albemarle & Pantego is organized in Virginia.—Almaden Branch is incorporated in California.—American National Transportation Co. is incorporated in Illinois.—American Rapid Transit Construction incorporated in California.—Denver, Texas & Fort Worth files articles in Colorado.—Elgin, Joliet & Eastern Indiana files articles in Indiana.—Grouse Creek is incorporated in Kansas.—Hiawassee obtains charter in Tennessee.—Kankakee, Mendota & Western is incorporated in Illinois.—Kanawha & Richmond is organized in West Virginia.—Little Rock & Alexandria files articles in Arkansas.—New York City & Westchester is incorporated in New York.—Rock Island, Dodge City & Denver is incorporated in Kansas.—St. Louis & Chicago files articles in Illinois.

Changes and Extensions.—*Illinois:* St. Louis & Chicago is to be extended from Litchfield, 8 miles.—*Minnesota:* Moorhead & Southeastern is to begin work between Moorhead and Breckenridge.—*Missouri:* Chicago, Milwaukee & St. Paul has track laid from Chillicothe to Ottumwa, Ia.—*Nebraska:* Union Pacific is to build from David City to Columbus.—*Texas:* Galveston, Sabine & St. Louis will build extension.—*Vermont:* Canada Atlantic will extend line to Alburgh Springs.—*Wisconsin:* Tracklaying is completed on the Wisconsin Central within 8 miles of Hurley.

Leases and Sales.—Marshall, Paris & Northwestern is sold to the St. Louis & San Francisco.—New York, Rutland & Montreal will be sold on June 2.—St. Louis, Fort Scott & Wichita will be sold on May 23.—Shenango & Allegheny Valley is sold.—Pennsylvania, Slatington & New England is sold.

Earnings.—Sixty-five roads report gross earnings for March, 55 showing an increase for the month and 10 a decrease.

Traffic.—Anthracite coal tonnage for the week ending April 16 shows an increase over the corresponding week last year of 7.8 per cent.; bituminous shows increase of 149.0 per cent.; coke for week ending April 9 shows increase of 44.1 per cent. Cotton receipts, interior markets, for the week ending April 15 show decrease of 49.4 per cent., as compared with corresponding week last year; shipments show decrease of 47.1 per cent.; seaport receipts show decrease of 61.5 per cent.; exports, a decrease of 34.6 per cent.; cotton in sight is less than at same date last year by 44.4 per cent.

Miscellaneous.—Arkansas Valley gives contracts for 100 miles of road.—Atlanta & Hawkinsville invites bids for construction.—New York, Lake Erie & Western obtains favorable decisions in important suits.—St. Louis & Chicago files mortgage for $4,500,000.—U. S. contract for steel is awarded to the Bethlehem Iron Works Co.

Contributions.

A Plea for the Independent Heater.

CHICAGO, Ill., April 18, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

On many accounts, it would be very desirable to heat passenger trains from the locomotive; but because of the accidents which have occurred from stoves, we ought not entirely to forget the advantages of having an independent heater upon each car.

The railway managers in this part of the country, and I presume everywhere north of Mason and Dixon's Line, will be able to recall instances when their passengers would have perished from freezing had they depended for heat upon the locomotive. The writer has known trains to be stalled within twenty miles of Chicago, and to have consumed in the stoves nearly all the woodwork of the seats of the cars, in order to keep from perishing; the locomotive having been dead for more than twenty hours, before they were rescued.

Just as it is possible to so arrange the air brake that the derailment of a car shall apply it to the whole train, so it is possible with the water heaters under the coaches to so arrange a trigger that the water shall be discharged upon the fire under all ordinary circumstances of derailment. It may be, perhaps, well to point out to railroad managers that any steam-heating system which does not provide for a furnace on each car will require for convenient operation a perfectly interchangeable coupling, so that the coaches may be interchanged all over the country; and, therefore, a standard coupling will be as necessary for heating purposes as it is and has been for the air brake. Such a coupling does not seem yet to have been offered, but if it were, my own observation leads me to believe that the great inconvenience of those systems of heating which do not provide a heater for each car will prevent any extensive adoption of them in this cold country.

The heating of trains from the locomotive has been frequently attempted in Europe; but has been found so inconvenient and insufficient, even in that mild country, that they have resorted to briquettes in sheet-iron stoves, and hot water in large flasks, to keep passengers from freezing to death; and have lately begun to introduce the American heater, in a modified form, under the cars. Why should we go backwards, instead of improving upon the best contrivances for the independent heating of each car?

On any long line the exigencies of the traffic require cars to be detached at many stations to be sent off on branches, to stand at isolated stations where there are no boilers during several hours, away from any steam heating apparatus or locomotive, receiving a complement of passengers when the thermometer is below zero, and if those passengers have to wait for the arrival of a locomotive before they can have warmth, and if the said locomotive should be detained by a hearty Western blizzard for several hours or more, don't you think the passengers would vote unanimously to take the chances with an old-fashioned stove in each end of the car, without any modern safety appliances whatever? Yours for the independent heater made safe.

ARCHIMEDES STEVENSON WATT, C. E.

The Rotary Steam Snow Shovel.

The following letters are interesting, as showing the performance of the Rotary Steam Snow Shovel on the Idaho Division of the Union Pacific. The performance of this shovel has been previously illustrated in these columns,* and it will be remembered that at Buffalo it threw a stream of snow clear over a trestle.† Since then the construction of the shovel has been materially improved in details. The knife wheel which cuts the snow has also been geared slower, as it was found that it ran at an unnecessity high speed, and threw the snow further than was necessary. It will, however, be seen from the letters below, the snow is still thrown a considerable distance clear of the track.

The main feature of the shovel remains unchanged. Blades like those of a screw propeller are set on a heavy horizontal shaft, which, being revolved by suitable independent engine and gearing, cut a channel in the snow, which is thrown either to the right or left, high in the air and clear of the track.

The machine had formerly two wheels, one the "knife-wheel" for cutting the snow and another revolving in the reverse direction, the "fan-wheel," for throwing the snow to one side. The wheels were driven by two shafts, one hollow and the other revolving within it. This arrangement has now been considerably simplified. The knife-blades are mounted directly on the fan-wheel, and but one shaft is used. The knives instead of being reversed by mechanism to cut either to the right or left, reverse automatically, and the engineer, by simply reversing the engine driving the wheel, can throw the snow either to the right or left of the track as may be most desirable. This is of course extremely useful when working in sidelong cuttings, or when working in a high wind. It would be obviously useless to throw the snow to windward, but as the snow can be thrown to leeward, it is sent entirely clear of the track however strong the wind.

POCATELLO, Idaho, March 12, 1887.

Mr. R. BLICKENSDERFER, *Superintendent Idaho Division Union Pacific Railway:*

DEAR SIR: I accompanied rotary from Nutria to Pocatello upon its arrival on this division. The work to do on this trip was very light, and except in flanging the machine had very little work to do on main track. It flanged the track in good shape, running at any speed, high or low. The only hard work done on this trip was in cleaning out Pascadero siding, which was done in under five minutes, the snow being hardly packed and frozen, and from one to four feet deep. In this trial the snow was thrown entirely over the main track and into Bear River, a distance of from 150 to 250 ft.

In attempting to clear an unused track, at Stock Yards, with plow working in back motion, a piece of machinery that had flaw in it gave way and prevented completion of the work. Plow, however, was able to run in forward motion fast enough to do work required of it between Stock Yards and Pocatello. On this trip the average speed made was slow, on account of truck journals running hot—a trouble which did not occur on any subsequent trip. In this trip an eight-wheel engine was used to shove the plow. The plow was sent to Shoshone shops during night of 5th, and broken part referred to above was repaired next morning and started from Shoshone at 15.40 o'clock to go up and clear out Wood River Branch, which had been blocked during preceding night by a 12 to 18-in. fall of fresh snow, accompanied by high winds which had drifted the cuts nearly full between Hailey and Ketchum. Found no snow and made good time to Tikura. Between Tikura and Bellevue found from 6 to 12 in. fresh snow on track, and so wet that in places the machine shoved it up into great masses ahead of it until struck by wheel, when it would break up and roll off on either side of an embankment, or if in cut would roll back in front of machine and be worked through wheel and exhaust. Between Bellevue and Ketchum found from 12 to 15 in. of snow on level, and the cuts filled to two and three feet deep, which was cleared out and track flanged without trouble and without diminution of speed, of an average of 18 to 20 miles per hour. The trip from Shoshone to Ketchum was made in 4½ hours, including a little over one hour time lost in taking water and looking over machines. In this trip a ten-wheel engine was all the power used to shove the plow and handle in addition thereto two special cars.

Feb. 15 I again accompanied the plow on a trip over Wood River Branch to clear out blockade, the result of heavy snow fall Saturday night 12th, after passage down of regular train, again on Sunday p. m. 13th, and very high winds Saturday night, Sunday and Monday p. m. An attempt was made on Monday to run regular trains through, but had to be abandoned on account of impassible drifts just north of Tikura. We started from Shoshone at 12 o'clock Tuesday, and after leaving Tikura found heavy snow fall and cuts filled with drifts, but passed through all of them except two without diminishing speed, clearing them and flanging rail perfectly. The two exceptions were, first, a cut about 2 miles north of Tikura, and between 500 and 1,000 ft. long, was found to be full to a depth of 5 ft. with very wet snow, of a character that would have packed into almost solid ice before an ordinary plow. The plow went through this without stopping, but the last half of it was run at a speed not exceeding two or three miles per hour, but even at this speed the flanger did its work and gave a clear rail for engine to work on. The second exception was in cut about one mile north of Le Duc Post-office, about 500 ft. long, drift sloping to the north, with snow on south side on level with top of engine cab, and on north side level with floor of same. When half way through this cut the south bank caved in between plow and engine and clogged track so that engine had not power to shove plow. We were compelled to cut engine loose from plow and back it out of cut and then shovel out the caved-in snow and flange rail, after which plow was shoved through without further trouble. From Bellevue through to Ketchum we found from 12 to 18 in. of snow on track, and all cuts well filled, but went through without trouble at a rate of speed of not less than 15 miles per hour. This entire trip was made through snow so wet that instead of plow cutting a clear square bank through cuts it would break into large masses and be shoved to one side; and the snow taken through wheel was thrown out in rain, sleet and ice—so much so that the entire train, plow, engine and coach, were entirely sheeted over with ice to a depth of from ¼ in. to 6 in. at end of run. The train arrived at Ketchum at 19 o'clock, seven hours after leaving Shoshone, from which 1 hour 30 min. taking coal and water, and 45 min. delay by bank caving in should be deducted, leaving 4 hours 45 min. actual running time. The plow cleared the road so effectually that the regular train with coach, baggage car, and ten loaded freight cars followed us without any difficulty. This trip was made with one ten-wheeled engine shoving plow and drawing special car and caboose. It was estimated by persons competent to judge, and who accompanied the plow on this trip, that it would have taken three ten-wheeled engines with ordinary plow, and one with flanger, from 12 to 18 hours to have done the work as well as was done by the rotary and one ten wheeler in seven hours. This estimate is proved to be too low from a trial made two days afterwards with ordinary plow and three engines, and with condition of road admitted to be not over two-thirds as bad as on this trip—for in last case it took 16 hours 45 min. to make the trip, and even then the track was not cleared sufficiently to permit the regular train to haul more than their coach and baggage-car beyond point where first snow was encountered.

One of the main points gained by use of this machine over ordinary snow-plows is in its cutting and leaving a clean bank no higher than surrounding depth of snow, thereby not increasing depth of cut, as is done by ordinary plow, and by throwing out the snow taken up with such velocity that it sinks into the snow along side of track instead of building up bank to drift back into cut. Respectfully yours,

C. L. LESLIE,
Assistant Superintendent.

POCATELLO, March 16, 1887.

Mr. R. Blickensderfer, Superintendent Idaho Division:

DEAR SIR: On Monday, Feb. 28, I went with rotary steam shovel up the Wood River Branch, from Shoshone to Ketchum, a distance of 69 miles. We left Shoshone at 8 a. m. and ran to Tikura, 30 miles, without finding much snow. From Tikura to end of run, we encountered considerable snow, drifted into about 15 cuts, some of them only 200 ft. long, and others 2,000 ft. As there had been no train over the road for 72 hours previous, the snow was packed and heavy. The first cuts the snow was quite wet, and in places 8 ft. deep on the left rail, as we were approaching, and about 4 and 6 ft. on the right rail. We had two ten-wheeled engines, 18 by 24 in. cylinders, coupled into plow to push it through. The plow went into the first heavy drift 200 ft. and stuck. The engines could not push it any farther, nor could they back out. Men shoveled the engines out, and leaving the plow in the drift backed the engines out and shoveled clear the rail. Engines were again coupled to the plow, which was started up, though the snow at the front of the plow was as high as the top of the wheel. The plow was forced through at a speed of two miles per hour, and the cut was completely cleaned.

I consider the reason for plow sticking was a want of unanimity in signals between pilot on plow and engineers on locomotives, and they forced plow too fast into drift, thereby choking the wheel, as it could not get rid of the snow as fast as it was been forced through, as there is a limit to its capacity, and, if overdone, it will cease working. I judge from its working that day that, if given plenty of time, it will cut through a drift, its own depth, at a speed not exceeding two miles per hour. After the pilot and engineers understood each other's signals, we had no difficulty, as the engines slackened their speed on approaching a heavy drift.

One locomotive engine could not have pushed the plow through that day, as the two engines were at times worked to their capacity. We reached Ketchum about 14 p. m., and left a clean rail the entire distance for the regular train to follow, which arrived 15 minutes later.

Assistant Superintendent Johnson and M. M. Hobart, of the Oregon Railway & Navigation Co., and W. T. Small, Master Mechanic of the Northern Pacific, went along with us to observe its work and took great interest in its performance. In order to give those gentlemen a test of its qualifications we coupled one locomotive to the plow and cleaned out a side track 1,000 ft. long at Ketchum that had been snowed under for about two weeks, snow was dry and hard, and by actual measurement taken by Mr. W. T. Small and myself was from 4 to 4½ ft. deep. It took just 3 minutes to clean this track and leave a clean rail. This ended the work for the day. The visitors seemed to be well pleased and considered it a first-class machine for the snow service.

JOHN S. HICKEY,
Division Master Mechanic.

The time given in the above letters includes that occupied in clearing side tracks, crossing trains, and other detentions.

The following are the official figures as to the mileage and the cost of running the snow shovel on the Idaho Division,

* See *Railroad Gazette*, Sept. 12, 1884.
† See *Railroad Gazette*, April 20, 1886.

and do not include some 600 miles run on the Wyoming Division :

Expenses of Running Rotary Snow Shovel February, 1887.

Rotary	Engineer's and firemen's wages	$270.20	
	Fuel—58 tons	116 00	
	Oil, tallow and waste	36.42	
	Material	70.01	$492.63
Pusher	Engineer's and firemen's wages	184 20	
	Fuel—111 tons	222.00	
	Oil, tallow and waste	16.85	
	Material	7.85	
	Labor	65.53	$490.43
	Total		$983.06
Miles run by rotary, February, 1887			2,930.2
Cost per mile			$0.16.9
Cost per mile, including pusher			0.33.5

The difference in the cost of wages on the shovel and pusher was due to the fact that a double crew was employed on the shovel, so that it could be worked day and night when needed, one crew sleeping in the caboose while the other was running the shovel. The small cost at which the road was kept clear is very remarkable. The wages of a large force of shovelers would soon exceed that amount, and the amount of work accomplished would be far smaller.

Lindstrom & Miller's Car Wheel Grinding Machine.

The engraving represents a machine employed for the last two years at the Altoona shops of the Pennsylvania Railroad for grinding drilled car wheels. No less than twelve of these machines are now in daily use, nine having been constructed at Altoona for use at different points on the Pennsylvania system. The special features of the machine have been patented by Messrs. Charles Lindstrom and W. T. Miller, of Altoona.

The advantage of grinding chilled cast-iron wheels, especially for passenger and locomotive service, has been satisfactorily demonstrated through several years of practice on the Pennsylvania and other railroads. Ground wheels, if made perfectly true, give smoother motion, and the life of the wheels, as well as the durability of road-bed, is considerably increased; while a slid wheel can be ground true, and its usefulness restored at a very insignificant cost. Instances are on record where wheels have been condemned for flat spots, after having made a few thousand miles only. These wheels have than been ground and again placed in service, after which they have been running two or three times as many miles as they did before they were ground, thereby bringing the total mileage above the average mileage of rough wheels. Some wheels have been ground a second time, and made three different mileages, which otherwise would have required three rough wheels under the same circumstances.

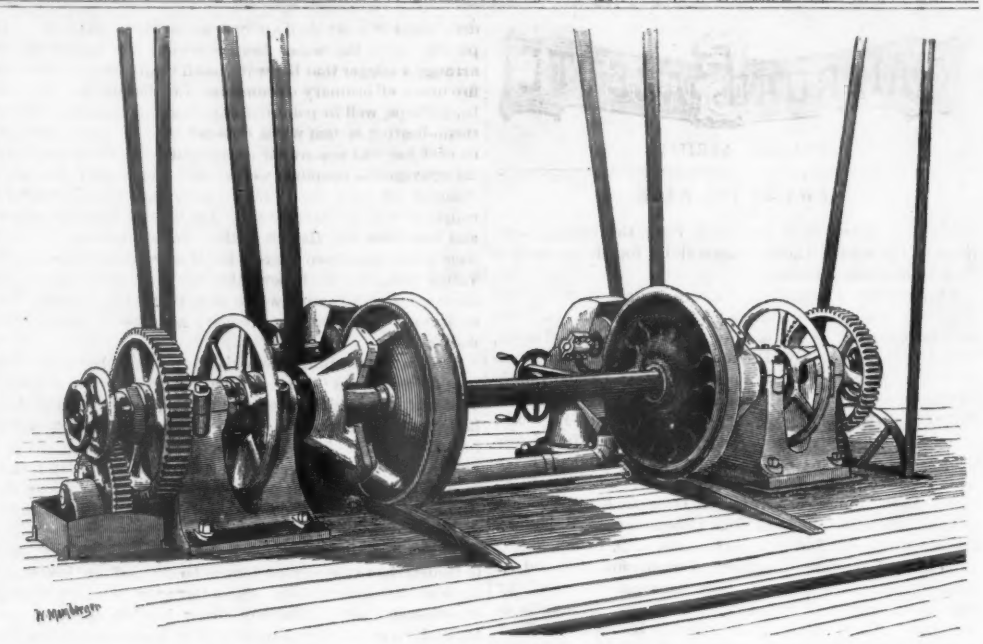
Out of every one hundred chilled cast-iron wheels made there is hardly a single wheel that can be strictly called round, as all are more or less oval in shape. Such wheels if if placed in service are more likely to receive flat spots than ground wheels, for the high parts of the wheels will become wedged against the brake shoes, and the wheels will slide on the rail. It is therefore economy to grind all new wheels before they are placed in service, as well as old wheels which have become flat from sliding, when the flat spot does not exceed 2 in. in length.

In order to successfully grind chilled wheels, it is essential to use a machine that is strongly built in all its parts, so that vibration is reduced to a minimum. The abrading wheels must be firmly secured to prevent them from following the shape of the wheel and merely polishing the tread instead of making the wheel round. Facilities must be provided for changing wheels in the shortest possible time, and all kinds of wheels, whether mounted on axles with inside or outside journals, should be ground without boring holes in the plates of the wheels. The machine must also be cheap and easily operated by one man, both when grinding and changing the wheels.

It is claimed that these machines will grind from six to eight pairs of new wheels, or five to seven pairs, of old wheels, perfectly true and round every ten hours, at a cost of 24 to 28 cents per wheel. This will be a saving for every old wheel ground equal to the difference between a new wheel and what the old wheel would bring as scrap, minus the cost of grinding, not taking into consideration that more mileage will come from a ground wheel than from a rough wheel, everything else being equal. In the above cost of grinding, labor, abrading wheels, oil and wear of machinery are all taken into consideration.

The special features of this machine are as follows: It consists of a heavy bed plate located even with the floor, upon which two strong head-stocks are firmly secured, one at each end of the plate. These heads are provided with triple spindles, one inside of the other, and the spindles are simultaneously revolved by a powerful gearing and a shaft running under the bed plate. The inside spindles carry the centres and support the wheels through the centre of the axle. They are horizontally adjustable to any length of axle by the hand wheels at the back of the head. The second spindles carry the gear wheels, and impart the revolving motion to the inside as well as the outside spindles by means of keys. The outside spindle which carries the clamping arrangement is horizontally adjustable by the large hand wheels located in the middle of the heads.

The clamping heads are provided with three arms having radially adjustable yielding contact points which are forced against the wheels by the large hand wheels and take hold at the under side of the rims. These contact points are made of tool steel, and shaped in two edges, and conform themselves to any irregularities in the shape of the wheels. On one side of the bed plate the abrading wheel posts are strongly secured. These posts have two slides for regulating the feed, and to the upper one the abrading wheels are so held in bearings that any yielding is impossible.



LINDSTROM & MILLER'S CAR WHEEL GRINDING MACHINE—ALTOONA SHOPS, PENNSYLVANIA RAILROAD.

A short truck is located under the car wheels, and is provided with a cam arrangement, by means of which the car wheels and axle are lifted up to the centre of the spindles and held there until secured, when the cams are lowered and the wheels swing free of the rails. The machine is also supplied with an exhaust fan to carry off the dust.

Although previous to its introduction other car wheel grinding machines had been in use, the work performed by them had not been satisfactory on account of their weak construction, which made it impossible to grind the wheels perfectly round and true. Another defect also existed, wheels on axles with inside journals could not be ground without making a hole in the plate of the wheel.

It is claimed that these difficulties have been successfully overcome in the machine illustrated. The trueing wheels are strongly supported, which prevents them from springing into any cavities that may exist in the treads of the wheels being trued, and the car wheels are both rotated by means of yielding contact points at the rim of the wheels. This arrangement reduces vibration to a minimum and secures a smooth surface. The mechanism for advancing the clamping points which rotate the wheels, is independent of the arrangement for holding the axle in a central position, whereby the length of the axle journal outside of the wheels is immaterial, and may be entirely absent, as is the case where engine truck wheels are trued. The yielding contact points are radially adjusted for different sizes of wheels. A special cam arrangement is attached for raising the wheels up to the centres, so that the man who operates the machine is enabled to exchange wheels in three or four minutes.

It is claimed that the following advantages are obtained by the use of this machine :

The two headstocks, each furnished with a horizontally adjustable centring spindle, enable the car wheels to be always kept in the centre of the machine opposite the abrading wheels, regardless of the length of the axle on which the wheels are mounted, and without being compelled to move the heads or the abrading wheel posts on the bed plate.

As the two headstocks each have clamping mechanism secured at the rim of the wheels, a rotary motion free from vibration is imparted to the wheels by the use of the radially adjustable arms on the clamping mechanism.

Wheels of different diameter can be trued up. The independent longitudinally movable centring spindles in connection with the independent movable clamping mechanism, renders it possible to support and revolve wheels for grinding, whether the axles on which the wheels are mounted extend outside of the wheels, as with outside journals, or stop at the hub of the wheels, as with inside journals, and without drilling holes in the wheels. The yielding contact points on the clamping mechanism adjust themselves to any irregularities in the shape of the wheels, and prevent undue strain on the parts. By means of this construction, the clamping of the car wheels is quickly effected without requiring special attention of the operator.

The rails (shown in the engraving) on which the wheels run from the floor of the shop to the machine being provided with a cam arrangement operated by a short lever, the car wheels and axle are always received in the machine at the right height to be secured by the centring spindles.

Improved Car Lamp.

The illustrations represent a new car chandelier manufactured by the Dayton Manufacturing Co., of Dayton, O., under patents granted to John Kirby, Jr., manager of the company.

It will be observed that the lamp in general construction is a departure from those in common use, in that it has but one central supporting hanger, which is constructed to perform the same functions as the four and five hangers commonly used in lamps of this character. This single hanger carries the shades and their attachments and is so constructed as to form a rigid support for the entire lamp structure with the least possible obstruction to light.

Most of the improvements shown in the lamp illustrated are applicable to over one hundred different patterns of lamps.

Fig. 1 represents lamp No. 121, one half being shown in full, with the lamp as a whole in its normal position. The other half is shown in section, with the oil-fount and burners lowered for the removal of the chimney and manipulation of the burners, and the chimney supported by the lamp frame.

Fig. 2 is a perspective view of the gravitating buffer and its attachments removed from the dome.

Figs. 3 and 4 show perspective views of the shade holding screw-threaded cylinders.

Fig. 5 represents a perspective view of the upper part of the oil fount and lock, with its cover plate removed.

Fig. 6 is a perspective view of the lower part and base of the hanger and its attachments.

The coupling device is so constructed as to allow the oil-fount to be lowered a suitable distance on suspending rods (*d*) and there automatically securely locked for the purpose of removing the chimneys without taking the oil-fount and burners down. This arrangement is shown in the half section, fig. 1. The device for accomplishing this result serves the dual purpose of locking the fount in two (or more, if desired) positions on the pendent rods, as shown in fig. 1. The importance and advantage of this arrangement when applied to lamps whose shades are too small in the neck to allow the chimney to be raised high enough to remove it without first taking the oil-fount down will be best appreciated by those most familiar with the care and handling of such lamps.

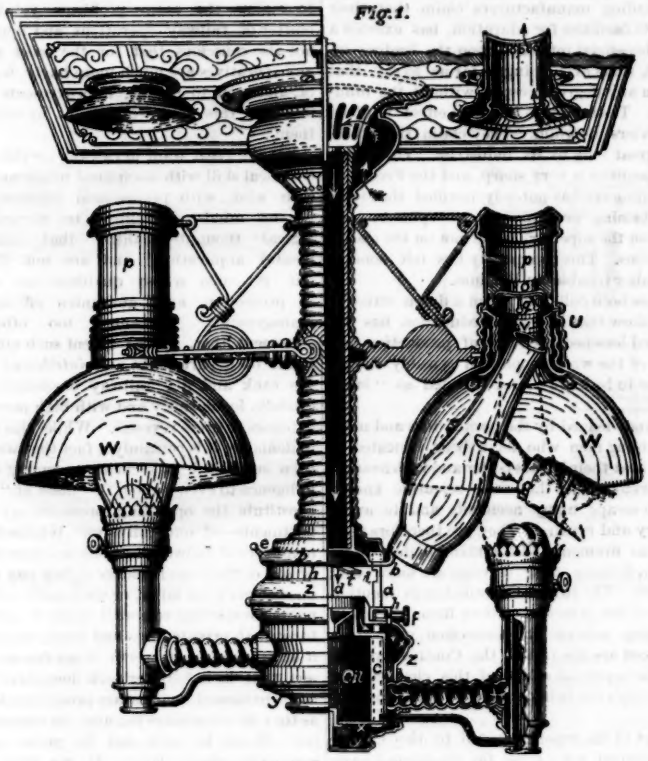
A device (*e*, fig. 1) is provided for sustaining the chimney, as shown in the half section of fig. 1; the operation being to first pull the spring knob *f*, figs. 1 and 5, until it clears the shoulder *g* on the lock case *h* (see fig. 5). The lock ring J, with its stem K (fig. 5), is then rotated within the case *h*, a slot *a'* being formed in the case ring to allow the ring J to be rotated sufficient to release the projections *i*, fig. 5, from the notches *l*, figs. 1 and 6. The fount then slides down the rods *d* until the lock ring J comes in contact with the lower notches *m*, fig. 6, when springs *n*, fig. 5, automatically cause the projections *i* to engage with notches *m*, and the fount is then locked in the position shown in the half section of fig. 1. The chimneys may then be lifted off the burners and hung upon the supports *e*, as shown, and the fount removed from the lamp frame, or the burners given any attention they may require.

A third improvement consists in a gravitating buffer (*o* figs. 1 and 2), arranged to slide freely within the dome *p*, fig. 1. This buffer is composed of a weight having a central bore for the escape of the products of combustion. An elastic or yielding metal cushion *q* is attached to the buffer. When the lamp is in its normal position as seen in the full view of fig. 1, this cushion rests on top of the chimney as indicated by dotted lines in the half section of fig 1, thus serving the triple purpose of providing for variations in lengths of chimneys, steadying the chimney at the top, and holding it down to its seat on the burner. The chimney thus cannot rise from its seat by motion of the car, which causes the lamp to smoke, while the elastic cushion *q* effectually prevents breaking of the chimneys. The weight is grooved at *r*, fig. 2, and the springs *s* remove all tendency to rattle or make a noise.

A fourth improvement consists in an arrangement of sheet metal springs *t*, figs. 1 and 6, interposed between the base of the supporting hanger and the top of the oil-fount when locked in its normal position as in full view, fig. 1; these springs press against the fount and prevent the annoying rattling of these parts, frequently heard in car lamps.

A fifth improvement consists of a device V, U, figs. 1, 3 and 4, for holding the shade W in position. As shown in fig. 1, this device has been in practical use for a number of years, and is composed of a thin sheet-metal cylinder V, with its lower end flaring outward to form a holder for the shade. This cylinder passes through the neck of the shade and engages with a corresponding screw-threaded cylinder U, which is attached to the dome *p*, as shown in fig. 1. The elasticity

Fig. 1.



IMPROVED CAR LAMP.

Made by the DAYTON MFG. CO., *Dayton, Ohio.*

Fig. 3.

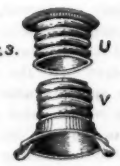


Fig. 4.

Fig. 5.

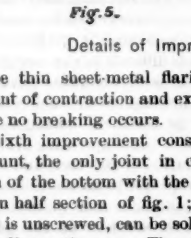
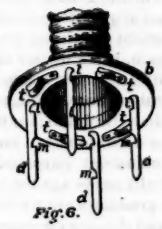


Fig. 2

Fig. 6.



Details of Improved Car Lamp.

of the thin sheet-metal flaring end of v admits of a great amount of contraction and expansion of the glass shade, and hence no breaking occurs.

A sixth improvement consists in the construction of the oil-fount, the only joint in contact with the oil being the union of the bottom with the walls of the oil holder, as seen at c in half section of fig. 1; and this joint, when the drip cup *y* is unscrewed, can be soldered as easily as the bottom of an ordinary tin pan. The advantage of this construction will be best appreciated by those having to repair lamps of this class. The oil holder is surrounded by an outer shell or casing z, which forms an air space *x*. The air for supporting combustion enters the hanger (which is hollow) near the top and directly under the ceiling of the car, passing down and around the oil to the burners in the direction indicated by arrows.

The double smoke bell or canopy shown in section in fig. 1 is intended to prevent the head-lining being scorched.

The Dayton Manufacturing Co. will cheerfully furnish any further information desired with reference to these improvements and the various styles of lamps to which they are adapted.

Technical Education on the Baltimore & Ohio.

It has already been noted that the directors of the Baltimore & Ohio have appropriated $25,000 for the Technological School of the company at Mount Clare for the current year, and agreed to appropriate $20,000 a year hereafter. This school was announced in an order by President Garrett, Jan. 15, 1885. A programme for its organization was laid down, and instructors were appointed. The youth in the employ of the company were to be divided into three classes, apprentices, cadets and cadet officers, with fixed terms of service in each class and fixed pay. All were eligible to the technological school who could pass certain physical and educational examinations. The last report of Mr. Coler, the principal of the school, states that some 500 boys were examined for admission in 1885.

"The results of these examinations went to show that not one of the 500 boys and young men in the various repair and construction shops was sufficiently advanced to pursue technical studies with profit to the company and to himself. Combined with this lack of elementary knowledge was a corresponding lack of inclination on the part more of these apprentices to make of themselves anything than ordinary routine and rule-of-thumb mechanics. It must be evident that such apprentices will require constant supervision in even the simplest details of their trades, and that when they become journeymen they will be untrustworthy and unprogressive. Thinking that perhaps a few of the most promising boys might, by receiving preliminary training in night-classes for six months or a year, be prepared for the more elementary technical studies, it was determined to give them instruction in the rudiments of grammar-school branches. About forty boys were required to attend night classes from the first of March to the twentieth of June, 1885. This was done with the hope that all might profit to a certain extent by the elementary instruction thus afforded, and that from these forty boys there might be a dozen or more who would work their way up so as to profit by the technical course we had in view for apprentices; but a short experience convinced us that for the most of these boys the attempt was made in vain. Only three out of these forty apprentices have made commendable progress in all the school studies, though none of them are any the less valuable to the service for having been required to attend the classes, and several have done well in drawing in spite of their deficiencies in academic studies. * * *

"From my own experience and study of the subject since my connection with this school, and from the testimony of teachers and employers in Europe who have made similar attempts, I am convinced that while it is possible and desirable to educate apprentices in technical subjects during apprenticeship, even though the instruction be wholly confined to night classes, it is equally certain that to try to educate boys who have not formed habits of study before entering upon apprenticeship is a useless waste of time, patience and money. Although there may be exceptions, the results are usually very meagre and unsatisfactory.

"Since March, 1885, there have been regular educational examinations every month, except July, 1886, of applicants for apprenticeship; and, with two or three exceptions, no boys have been admitted to apprenticeship at Mt. Clare without first trying this examination. At first we had to make the standard of requirements very low, in order to get enough boys to supply the demand for apprentices; but there has been a gradual, though decided, elevation of that standard, so that at the present time none can be admitted without a fair knowledge of the rudiments of elementary English branches; nor then without demonstrating some ability to think, and expressing a willingness to avail of the school-instruction by regular and prompt attendance at the classes if admitted to apprenticeship.

"As the result of these examinations we had when the school year began in October, 1885, about thirty apprentices capable of pursuing more advanced studies. Guided somewhat by our experience the preceding term, and profiting by observations that I had made in the management of workingmen's and apprentice schools in Europe, we made some decided changes in the subjects and methods of instruction. Classes were formed in drawing, in mathematics, in the study of the locomotive engine, and in physics. Instruction was also given in English and in history, and a few classes were still sustained for the elementary instruction of the forty boys who had been in the school the previous term. These classes, with some changes and additions, were sustained during the school year ending in June, 1886, and about eighty different boys, more or less advanced, received instruction during that year, all of whom were required to take drawing and to choose at least two academic studies. In addition to the general class instruction; boys were encouraged to read many books on general and technical subjects, and a few of them were induced to take an interest in the scientific and mechanical journals which come regularly to our library. We also had a number of science lectures illustrated by simple experiments. * * *

"It has been our constant endeavor to carry the instruction beyond the school-room into the shops. Owing to difficulties which are obvious and inherent to such an undertaking, our progress in this direction has been slow. Something has been done, however, in the way of supervision and systematic instruction of apprentices in the shops, and our experience in this direction I regard as invaluable, so far as it has gone.

"Investigations in the shops by conversations and observation have developed the fact that many boys and young men had completed or almost completed their apprenticeship in the machine-shops without being able to tell the difference between cast and wrought iron, without knowing whether steel is a native or manufactured product, and equally ignorant of many other simple though important and significant facts which are intimately related to their trades.

"In the performance of his specified duties as shop-instructor, Mr. Scribner made a study of the various trades, machines and processes in the shops, and of the successive steps in apprenticeship, with a view to recommending a course of shop instruction that should be parallel to the theoretical studies taught in the school. By short, pointed conversations with the boys while at their machines, which did not at all interfere with the work they were doing, the shop-instructor was enabled to set boys to thinking intelligently about the machines and the work upon which they were engaged. In this way the class-room instruction could often be immediately applied, and apprentices were directed to books and mechanical journals where they could get still further knowledge.

"Mr. Scribner also took groups of boys from machine to machine and from shop to shop for the purpose of studying the machinery and mechanical processes in detail and in their relation to each other. Attention was called to the uses of the machines and the scientific principles involved in their construction and operation, and one class of advanced boys were thus permitted to supplement their class-room study of the locomotive engine by seeing its parts and the successive steps of its construction.

"It seems to me that judicious and systematic shop instruction will do more toward bringing about visible economic results than any other feature of the school. I am firmly convinced that it is possible to arrange parallel courses of instruction for the school and for the shops of such a character that the shop work will create and intensify interest in the school-work, and *vice versa*. * * *

"With reference to what the school is accomplishing this year, I am glad that I can report satisfactory results, considering the disadvantages under which we are compelled to work. As the result of the educational examination and the inducements which the Technological School offers to aspiring boys and young men, we now have at Mt. Clare, in the shops and enrolled in the school, about seventy apprentices whose ability is good and whose early education has not been wholly neglected. Instruction is given in drawing, descriptive geometry, physics, mechanics, algebra and geometry. There is a strong demand for classes in steam, the locomotive engine, mensuration, and other technical subjects, as well as for systematic shop instruction, but the limited fund at our command prohibits the employment of teachers for these classes. In addition to the class instruction, books are given out to be read and reported on, and attention is frequently called to the mechanical journals on the library table. Some of the boys draw back numbers of these journals from the library in order to read them at their homes. It is our purpose to continue the illustrated lectures on scientific and mechanical subjects. These occur every week or every two weeks, and at the close of the lectures opportunity is afforded for asking questions and discussing the points that have been presented. Students and other employés at Mt. Clare attend these lectures. Occasionally a half hour after the lecture is spent in a social way, so that teachers, students and visitors are enabled to become acquainted. In this way much is done toward begetting a feeling of *esprit de corps* on the part of all who are present. Although, on account of the pressing demand for new engines, many of the apprentices are this year required to work in the shops from two to four nights each week, our classes have, nevertheless, made commendable progress in their studies—their advancement and interest this year being by far the most satisfactory to the teachers, of anything that has been known since the school was organized.

"The fact that boys of ability will enter the shops to get a trade and an education at the same time, and that they can and will learn under circumstances so discouraging as those resulting from our limited facilities for instruction and from the requirements of night work in the shops, goes to show the desirability and the economic value of school instruction in connection with workshops.

"That progress in school studies was at all possible under such circumstances is to be attributed to the superior ability and praiseworthy perseverance of the apprentices that have lately entered the service.

"Many of these young men are soon able to do a journeyman's work and to increase the efficiency of the shops in numerous ways by their intelligence and quickness of perception. They are willing to accept apprentice wages for their services in order that they may advantage by our class instruction. But I very much doubt whether we can hold the best of these young men unless they are afforded more instruction than they now have. Some of them are talking of going elsewhere to enter school, and I cannot blame them for their dissatisfaction with our present school facilities.

"Of the young men who have become apprentices since the inauguration of the school, our records show that the number who have been at least two years in their several institutions are as follows: Baltimore City College, 5; other high schools, 7; McDonogh School, 2; University of Alabama, 1; St. John's College, 1; Johns Hopkins University, 1 (one year only); Naval Academy, 1; St. Louis Manual Training School, 1. Three boys have come from the Baltimore Manual Training School. A number of other boys have attended academies or good grammar schools, and not a few have come from the country. Although the previous school advantages of these country boys have not been very great, they are nevertheless among the most faithful and earnest workers in the Mt. Clare school and shops, and are making good headway in their school and shops.

"We have constantly endeavored to do the most that could be done, with our limited facilities, toward advancing the individual interests of boys who have come here for the purpose of obtaining an education while learning their trades. But we have not lost sight of the fact that in a school of this character, sustained by a corporation in connection with its shops, the highest good should be looked for in the furtherance of the material interests of those whose money goes to pay for the instruction. Our efforts to make the instruction practical, and, as far as possible, of immediate usefulness to the company, have already been recognized and appreciated by some of the heads of departments. We have been asked to recommend young men for positions requiring intelligence and skill, and the demand for young men specifically qualified for certain positions is now greater than we can supply.

"The educational requirements for apprenticeship have greatly improved the character and ability of apprentices at Mt. Clare. That industrial corporations should recognize the value of common school training to such an extent as to make educational qualifications a condition of admission to their shops for the purpose of learning a trade, is an important movement in both education and industry. I would recommend that the monthly educational examination be extended, under the management of the school, to shops along the entire line. This can be done by sending the questions each month to the managers of the various shops, who should see that they are submitted to applicants for apprenticeship. The papers could then be sent to Mt. Clare to be looked over, graded, and returned to the proper authorities. The standard would of course have to be very low at first, but it could be elevated from month to month. The expense in this matter would be insignificant compared with the important economic results that could thus be attained." * * *

Dr. W. T. Barnard, Assistant to the President, was charged with the duty of making a special investigation of the subject of technical education in its relation to railroad service.

He visited the principal technical and industrial schools in the United States, England, and on the Continent, and read a very extensive literature on the subject. The report which he has lately submitted is a pamphlet of 168 pages and 70 pages of appendices. The report treats of the effects of technical instruction in Europe, the development of industrial education in the United States, the industrial and educational needs of Baltimore, the advantages to railroad interests of scientific training of workmen, technical instruction in the B. & O. service, and the technical school at Mount Clare.

The facts presented concerning the effects of technical instruction in Europe are not new to those who have paid any attention to the subject, but they are striking and important. In order to counterbalance the advantages some engaged in a given industry enjoyed through the possession of cheaper raw material, labor, prestige or favorable situation, their competitors of foreign—and even of the same—nationality were compelled to look to improved methods of manufacture or production for ability to hold their own, and were thus brought to realize that educated labor and technical skill were the soundest elements with which to defend themselves in trade competition, in that they promote excellence of execution, inventiveness, enterprise and all the qualities required to successfully conduct progressive industries. Under this pressure producers and manufacturers, through their guilds and other associations, were soon able to exert an influence upon their government which has resulted in every European nation making greater or less provision for public industrial education; until at this time not only England, France, Germany, Austria, Switzerland, Holland and Italy, but all the minor Continental states, have their governmental schools for both elementary and higher technical instruction; and even Russia—so far behind all other nations of Europe in elementary education—has found it necessary, in order to maintain her home industries, to make quite liberal provision for the maintenance of mechanical and manufacturing schools, and has established two great imperial technical institutes—one at St. Petersburg and the other at Moscow—which are classed as amongst the finest in Europe in point of equipment and ample means. The encouragement which that government is giving industrial education has been supplemented by the action of leading Russian railroads, which have established schools for their people at their principal works.

But it is in Germany and Switzerland that the movement for industrial education has attained its highest development. In the latter country the British Royal Commissioners found the value of its technical schools distinctly illustrated in the marked improvement of manufactures; in the elevation of the producing classes; in the diminution of crime; in the popularization of education, and, generally, exercising a most important influence upon the nation's industries and welfare. In summarizing the results of their investigations in Germany they remark that the conviction is universal among the German people that they can only meet the competition of their rivals in other countries by training their workmen in taste and skill, and that the prosperity of their industries will increase only in proportion as they keep up the efficiency of their schools and spread their influence among the workers themselves.

The direct and indirect effects of technological schools upon the industries of their respective countries were, immediately upon their establishment, felt to be beneficial in the highest degree. Their graduates were eagerly sought out to fill important and responsible positions in manufacturing and commercial establishments, many of which had sustained serious losses through the ignorance and consequent bad management of administrative officers, and this inquiry soon far exceeded the supply. As the result of this appreciation of, and demand for, skilled laborers and supervisors, many enterprising corporations, and even private firms, engaged in manufacturing and other industries dependent for their successful operation and development upon intelligent direction and skilled labor, individually organized scientific schools and training classes in connection with their works. Some of these private schools excel most governmental and municipal institutions of similar character in enterprise, progressiveness and immediate practical results. The conductors of many of them claim that the best results are obtained where intimate relationship between the school and the actual workshop is maintained. As illustrative of this method of combining practical and theoretical education, I cite the schools in successful operation at the mammoth works of Sir William Armstrong, at Elswick; at the great works of the London & Northwestern Railway Company at Crewe (where more than 9,000 men are employed and 600 apprentices and young journeymen attend the evening classes); and that at the works of Messrs. Mather & Platt, extensive iron manufacturers at Manchester. These are but examples of a large class of schools conducted in connection with manufacturing establishments which follow this system of education, and it is reported that a large additional number of corporations and firms, encouraged by the increased profits realized by those who have adopted it, are arranging to inaugurate similar instruction at their works.

Crefeld, Prussia, a city of about 80,000 inhabitants, relies almost entirely upon the silk industry for its support, and its revenue therefrom amounts to more than $20,000,000 annually. Its leading merchants and manufacturers unhesitatingly affirm that this great industry is very largely dependent for its success on the influence of their technical school, which is one of the best of its kind in all Europe. They declare that, among other benefits resulting from the school, it raises the tone and increases the knowledge of rising manufacturers and foremen, and by spreading technical education broadcast among industrious and ambitious artisans, very materially widens the field from which successful managers and specialists may be chosen. Mulhouse, Germany, affords another illustration of the fact that an industry may largely depend upon technical education. Its leading manufacturers claim that their textile museum, by its facilities for education, has exerted a most important and beneficial influence upon the leading industry of the district, some even going so far as to say that the trade could not in any degree prosper without the influence of this museum. Testimony to the same effect is given by employers at Verviers, Belgium. They claim that technical education is a great help to its industries. Their competition with other localities is very sharp, and the President of its Chamber of Commerce has publicly testified that their chief hope in maintaining pre-eminence as spinners and manufacturers rests on the superiority and not on the cheapness of their productions. This community has felt none of the evils of the late labor troubles in Belgium.

Similar evidence has been collected from a dozen cities of Europe, all going to show that industrial education has improved the quality and lessened the cost of production, improved the condition of the work people and sensibly diminished what have come to be known and dreaded as "labor troubles."

It is commonly acknowledged by the proprietors and managers of mines that young men who have been educated in technological schools heat their boilers better and with less coal than do the other workmen, and that their scientific knowledge enables them to escape many accidents and to avoid stoppage of machinery and repairs. They are therefore very much sought after as firemen, and command higher wages than common firemen, because their services are more valuable to their employers. The Royal Commissioners mention the fact that several of the principal colliery firms of Europe have organized mining schools in connection with their works, and so convinced are the rest of the Continental colliery proprietors of the beneficial effects of this character of education that like schools are being generally established in the coal districts.

The sum of that part of the report devoted to the United States is that the technical schools so far established have made, and can make, but little impression on the great *mass* of the people as being too few, too expensive, too theoretical or not accessible; while the general system of popular education is terribly inadequate in that it unfits and disinclines the youth of the country for handicrafts. This is a fact which must be apparent to every one who carefully considers the matter; and its consequences are more and more apparent every day in the numbers of helpless, discontented, useless young people seeking a livelihood.

Considering its importance and magnitude, there has been a singular dearth of discussion and testimony upon the subject of technical training for railway officers and employés. While there seems to be a general agreement that, because of the enormous capital and allied interests involved, and of the technical knowledge and skill necessary to successfully conduct its varied and far-reaching operations, railroading has acquired the dignity of a profession, fully as exacting and requiring equal professional skill and intellectual attainments as the liberal professions, I fail to find that any of our railway managers have a proper appreciation of the situation, or that there has been any well-digested effort in the direction of educating railway officials or employés upon systematic lines.

It has become the almost universal practice of our great railway corporations, and especially those whose lines are reaching out into undeveloped and sparsely settled territory, to assume the entire repairs of their plant, even when they amount to practical reconstruction, and there is also a steady tendency on the part of such companies in the direction of manufacturing their own equipment from raw materials. This places them in the category of manufacturers, and makes them amenable to the laws and factors regulating production, and, further, makes applicable to them much of the testimony heretofore given as to the value of technological instruction in mechanical pursuits. Because of the nature of their service, involving the transportation and care of many lives and valuable property, no less than as a matter of economy, is it of prime importance to such corporations that, in the construction and in the repair of their rolling stock and appliances, they should employ workmen of exceptional competency. It is unnecessary to comment upon their great responsibilities as guardians of life and property, but from a merely sordid point of view, in their extensive mechanical operations, economy and credit result from the employment of intelligent laborers, who understand the theory and purposes of their work, and who have the scientific knowledge that gives them, beforehand, a realization of the proper quality and quantity of material to be used, and enables them to anticipate the results of the labor they must expend upon that material to produce given results; *per contra*, corresponding danger and loss result from the employment of workmen who, lacking this knowledge, are compelled to experiment upon their material, and who require constant supervision, instruction and reinstruction. Many of our railroads employ *armies* of people, all of whom are supposed to be technically expert in their various avocations—and they need to be. Even a good track laborer is not found ready made. It is a well known fact that in many railroads only one or two men in a road gang know how to properly tamp a tie so that it will not require resetting the same season; and I know of extensive lines that do not possess a foreman—perhaps not a supervisor—who can adjust a curve with instruments.

That most of those who have risen to positions of responsibility and trust in railway service in this country are honest and faithful, goes without saying; but integrity and industry are not sufficient; they should also, as aforesaid, be men of intelligence, and should possess not only a special knowledge of their own departments, but also an accurate understanding of related departments of the service. Where is the intelligent railroad official who has failed to realize the many problems yet to be solved in the matter of railway operations and appliances, and who is not also conscious that, for the most part, railroad officers and operatives are much more likely to fail in appreciation of, and even to oppose, improvements and contrivances of merit in this field worked out by others, than to originate them?

But the great want in railway service is men who combine technical skill with disciplined minds and broad intelligence; men who, with professional experience and knowledge, possess minds disciplined to accurate observation and logical thought—qualities that come from sustained mental application, and are not likely to exist without it; men whose qualifications make them worthy of promotion, and guarantee efficient and economical management. I cannot too often emphasize the statement that, to the extent such qualities are lacking in heads of departments, and *intelligent* service is lacking in the rank and file, railway operations will be conducted crudely, inefficiently and with high percentages of operating expenses to gross revenue. While this is so patent as to be undeniable, it is certainly a fact that we have not generally been successful in securing enough of educated skill and intelligence to even leaven the mass of "practical" men who constitute the operating forces—to say nothing of other departments—of our railways. Whether this be because the managers of railway interests are apprehensive of the disapproval of their stockholders if they pay more than the lowest market price for labor, or personally entertain too indifferent notions respecting educated talent to induce them to compete for it with private firms and local corporations that do value it at its commercial worth, is not for me to say; but I do assert that it is folly for such long-lived corporations as railroads to hazard their future prosperity for temporary profits, as they do when allowing and encouraging their administrative officers to seek and to prefer uneducated—because nominally cheap—labor. If we expect to operate such properties on business principles, and not for mere speculative results, our railway managers must provide for the better education of the rank and file of their employés. By means of workshop schools, properly conducted, a railway company may not only obtain intelligent help cheaper than it could otherwise be secured, but it may also so shape the instruction therein as to exactly adapt it to the requirements of its service, and thus give it a special value not attainable elsewhere at any price. Such schools also seem to offer the easiest and cheapest solution of the problem how to secure a corps of workmen and operatives combining technical skill and general intelligence in a a high degree with that special acquaintance with the needs and details of operation so important in railway service.

Again, it is a matter of common observation that our universities, colleges, academies and high schools turn out, in superabundance, young men possessing theoretical knowledge and dialectical skill in sufficiency, but who, lacking manual expertness and practical knowledge, are comparatively useless for industrial purposes. Similar complaint is also very generally made against all our technological schools—that their graduates are too theoretical and not sufficiently practical, and this must necessarily be so wherever such schools are unconnected with shops operated as *bona-fide* industrial enterprises. On the other hand, it is difficult to procure at any price men who combine superior skill, comprehensive mechanical knowledge and general intelligence in such proportions as to make them valuable as foremen, managers and specialists in mechanical pursuits or in the operating branches of railway service. An appreciation of this fact, and of the necessity for educating their workpeople to an understanding of modern railway machinery, appliances and methods, has led a number of managers to seek the services of the graduates of technical schools as assistent foremen, assistant supervisors, assistants to engineers of roadway, master mechanics, etc. After some actual experience these young men are put in line of promotion, and inquiry shows that generally they stand well in their respective corps, but, even after going through the shops, such graduates continue more theoretical than practical, and this constitutes the great objection to railroads taking into service technological school graduates, instead of *educating* their own young men. The Pennsylvania Railroad pursues the plan of exacting of the graduates of technological institutions entering its service a novitiate in the construction and repair shops at Altoona before they are permitted to enter active service. Many young graduates of technical schools so highly value the opportunity of studying the scientific methods and enjoying the instruction of the Altoona shops as—it is said—to disregard pecuniary compensation, in a wise desire to avail of the fine training obtainable there.

The method of combining theory and practice so as to give both an educational value has during the past year been pursued with signal success in preparing the apprentices at Mt. Clare for cadetships in the B. & O. service. When it became publicly known that technological instruction had been inaugurated at Mt. Clare, we were besieged by applicants for admission to the school whose social status, scholarship and culture were infinitely superior to anything found among the 147 apprentices already in service, whom we had examined. Many of these young gentlemen entered as regular apprentices, without favorable discrimination as to hours of work or pay; in fact, they accepted low wages for services far more valuable to the company than those of the average uneducated apprentice. By supplementing their shop-work with the class instruction which was specially adapted to it, they have achieved excellent records, and now possess a very solid foundation for a higher technical course, in which theoretical instruction may predominate, and after a year or two

Fig. 1.

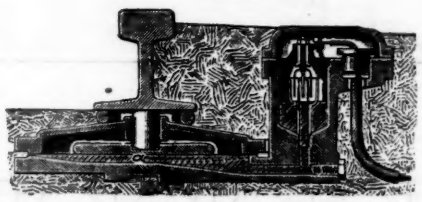


Fig. 2.

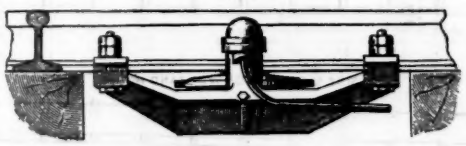
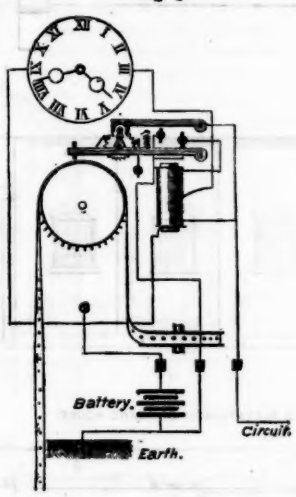


Fig. 3.



SIEMENS & HALSKE'S CONTACT APPARATUS FOR SPEED RECORDER.

of further study they will honor the service in whatsoever positions may be assigned them.

That such training as is here advocated will also be a source of profit to railway corporations, by diminishing the tendency to dissipation on the part of workmen, and thus increasing their efficiency in the shops and on the line, is easily demonstrable. It is not putting it too strong to say that ignorance is the great centre from which radiate intemperance, coarseness, brutality, vice, conceit, arrogance, irregular habits, and almost every other trait of character that a good workman should *not* possess.

The system of examination of applicants for apprenticeship inaugurated by the Baltimore & Ohio Co. nearly two years ago, was regarded as a hardship by many people, and especially those who had uneducated sons they wished admitted to the Mt. Clare shops. They did not consider that with lack of intelligence is always combined an absence of ambition on the part of a boy to make anything more than an ordinary mechanic of himself; that much more time is necessarily consumed in teaching a trade to an uneducated boy than to an educated one; that the former is not nearly so useful during apprenticeship as the latter, and that when he has acquired the manual skill of his trade, the uneducated workman will still be the less useful of the two, because lacking those valuable habits of careful observation and systematic thought that result from scholastic training, and are hardly ever otherwise acquired

Upon the inauguration of compulsory class instruction at Mt. Clare, the same sort of protest was freely indulged in by opponents of the measure, who argued that corporations have no right to compel their apprentices to attend evening school after a day's work, and that anyhow the results of compulsory attendance would be disappointing; for, although boys might arbitrarily be compelled to attend evening classes, they could not be made to learn against their will.

These extracts from Dr. Barnard's report give an idea of its general argument, and we close them with the following outline of the plan contemplated:

1. Instruction (in the apprentice class, of such boys now in or hereafter admitted to the service as can pass the examination therein indicated), of a character that will make them skilled and intelligent mechanics. Such apprentices as, in this course, developed a fair amount of ability and fidelity would, naturally, graduate into the second or Cadet class. This *first class* course should, however, provide within itself all the elements of technical instruction necessary to complete a journeyman's education.

2. The *Second or Cadet course* should also be complete within itself, and should provide such technical instruction in all the departments of railway service as would fit its students for all subordinate positions of responsibility and trust in the service—corresponding to what is known in European schools as the foreman's course of study. This course, while involving more thorough and wider theoretical instruction than the apprentice course, should, to the greatest extent possible, be framed with reference to the practical mechanical operations of the shops and of the service generally. Unless very radical changes can be effected in the common-school methods practiced in Baltimore, I apprehend that a very small proportion of the apprentice class will be able to take this higher instruction, and that we will have to look to the graduates of technological and science schools in other sections of the country that *do* afford industrial education to their citizens, for the material to constitute our cadet class. The widespread interest developed outside of Baltimore in the technological work at Mount Clare, and the numerous applications for admission to that school from the graduates of technological and science schools and others of equal mental discipline, give full assurance of an unlimited source of supply, and that this class will not only provide subordinate officers in sufficient numbers to meet the utmost demands of the service, but also men whose primary education will qualify them for still higher positions.

3. It will be the object of the *Third or Cadet Officers' course* to give to those who graduate with honor from the second class (and who have therein shown themselves possessed of ability and educational qualifications above the verage) further technical training, of a still higher and more comprehensive type, which, when combined with familiarity with the operations of the various departments of the service, will go far towards qualifying the students of that course for the highest positions in the company's gift. To this end, opportunity should be afforded the pupils of this course, in its last year, to actively participate in the production, care, repair and improvement of railway plant and in the practical operations of the service. This could readily be done—and with advantage to the service also—by distributing these students among the several departments as assistants—at the same time maintaining their connection with the school for further educational purposes. I have already shown how such an infusion of new blood into our mechanical and operative departments would inure to the benefit of the company.

Siemens & Halske's Contact Apparatus for Speed Recorder.

We give in this number illustrations reproduced from *Glaser's Annalen* of an improved apparatus by Siemens & Halske, of Berlin, for making the contacts in the train speed recording apparatus referred to in a previous number. The old recording system consisted in causing marks to be made on a continuously moved strip of paper by electric currents caused by levers depressed by car wheels at regular distances, giving a record of the time occupied in passing over the spaces in question.

The improvement consists in using a button under the rail operated by its deflection, and in cutting slots in the paper instead of making marks, while using a peculiar device for prolonging the contact, which has been found too short to make an observable mark where a single engine passes over

Fig. 1 represents the contact-producer, which consists of a small cast-iron disk-shaped reservoir bolted to the under side of a rail in such a manner as to cause the plunger shown to be slightly depressed by the deflection caused by the passage of a wheel. The plunger deflects the plate shown at *a*, causing it to expel the quicksilver which fills the hollow space under it (the plate is shown in the figure depressed to contact with the bottom of the reservoir). The quicksilver escapes through a passage of $\frac{1}{650}$ of the section of the main reservoir into a small cylinder from which it overflows into a surrounding cup. Into this cylinder and the cup dips a fork insulated from the apparatus and connected with the transmitting wire. Contact is effected by the mercury rising around the fork, and contact is maintained until the mercury in the cup turns off through a small hole indicated in the entrance cylinder. The plunger under the rail is restored to its position by the pressure of the mercury.

The plunger connection with the rail is inclosed by a rubber gasket, and no part of the apparatus is open to interference by snow or ice.

In the recording apparatus, fig. 3, the lever shown as making the mark on the paper strip carries a ratchet wheel, which, by means of a small pin, carries a weighted lever. As soon as the recording lever begins to vibrate, the ratchet is turned by the action of the pawls shown, which are fixed to the case. The upper lever deprived of support drops and completes the electric circuit in case the latter is no longer kept open by the passing train. The return of the ratchet to its first position raises the upper lever and destroys the contact. The effect of the above is to keep the circuit open not less than the time required to turn the ratchet once round.

It is obvious also that the action of the heavy upper lever is to hold the spring of the lower lever in tension, so that a very small current will pull it down. Once down, the weight of the upper lever is off, and the spring acts with full power, which the short circuit is fully able to resist. The consequence is that a much smaller battery will run the apparatus than if the line current were required to counterbalance the spring.

Telegraphic Train Orders.

Below will be found the code of rules for the movement of trains by telegraphic orders, as provisionally adopted by the General Time Convention at New York, April 14, 1887. The general train rules (other than these) which were provisionally approved last October were at this meeting finally adopted, with very few changes, so that the next general change of time (May 15) will probably see the enforcement of the whole code on a large number of roads. The final adoption of the telegraph rules, which there is very little doubt of, comes up at the next convention (October, 1887).

RULES FOR THE MOVEMENT OF TRAINS BY TELEGRAPHIC ORDERS.

500. Special orders, directing movements varying from or additional to the time-table, will be issued by the authority and over the signature of the Superintendent. They are not to be used for movements that can be provided for by rule or time-table. They must not contain information or instructions not essentially a part of them.

They must be brief and clear, and the prescribed forms must be used when applicable; and there must be no erasures or interlineations.

[NOTE.—On roads whose organization provides that any other officer than the Superintendent shall direct train movements, the official title of such officer may be substituted in the above rule. The Committee considers it essential, however, that but one person's signature should be used in directing train movements on any dispatching division.]

501. Each order must be given in the same words to all persons or trains directly affected by it, so that each shall have a duplicate of what is given to the others. Preferably an order should include but one specified movement.

502. Orders will be numbered consecutively for each day as issued, beginning with No. 1 at midnight.

503. Orders must be addressed to those who are to execute them, naming the place at which each is to receive his copy. Those for a train must be addressed to the conductor and engineman, and also to a person acting as pilot. A copy for each person addressed must be supplied by the operator.

504. Each order must be written in full in a book provided for the purpose at the Superintendent's office; and with it must be recorded the names of trainmen and others who have signed for the order; the time and signals, showing when and from what offices the order and responses were transmitted; and the train dispatcher's initials. The records must be made at once on the original copy, and not afterward from memory or memoranda.

[See note under Rule 500.]

505. The terms "superior right" and "inferior right" in in these rules refer to the rights of trains under the Time-table and Train Rules, and not the rights under Special Orders.

506. When an order is to be transmitted, the signal "31" (as provided in Rule 509), or the signal "19" (as provided in Rule 511), meaning "Train Order," will be given to each office addressed, followed by the word "copy," and a figure indicating the number of copies to be made, if more or less than three—thus, "31 copy 5," or "19 copy 5."

507. An order to be sent to two or more offices must be transmitted simultaneously to as many as practicable. The several addresses must be in the order of superiority of rights of trains, and each office will take only its proper address. When not sent simultaneously to all, the order must be sent first for the train having the superior right of track.

[NOTE.—On roads which desire the operator at a meeting point to have copies of the order, the several addresses will be, first, the operator at whose station the trains are to meet and next in the order of superiority of the rights of trains.]

508. Operators receiving orders must write them out in manifold during transmission and make the requisite number of copies at one writing, or trace others from one of the copies first made.

509. When an order has been transmitted, preceded by the signal "31," operators receiving it must (unless otherwise directed) repeat it back at once from the manifold copy, and in the succession in which their several offices have been addressed. Each operator repeating must observe whether the others repeat correctly. After the order has been repeated correctly by the operators required at the time to repeat it, the response "O K," authorized by the train dispatcher, will be sent, simultaneously to as many as practicable, naming each office. Each operator must write this on the order with the time, and then reply "I O K," with his office signal.

Those to whom the order is addressed, except enginemen, must then sign their names to the copy of the order to be retained by the operator, and he will send their signatures to the Superintendent. The response "complete" with the Superintendent's initials will then be given, when authorized by the train dispatcher. Each operator receiving this response will then write on each copy the word "complete," the time, and his last name in full, and will then deliver a copy to each person included in the address, except enginemen, and each must read his copy aloud to the operator. The copy for each engineman must be delivered to him personally by ——, and the engineman must read it aloud and understand it before acting upon it.

[NOTE.—The blank in the above rule may be filled for each road to suit its own requirements. On roads where the signature of the engineman is desired, the words "except enginemen," and the last sentence in the second paragraph may be omitted. See also note under Rule No. 500.]

[Individual operator's signals may be used when desired in addition to office signals, as here and elsewhere provided for.]

510. For an order preceded by the signal "31," "complete" must not be given to the order for delivery to a train of inferior right until "O K" has been given to and acknowledged by the operator who receives the order for the train of superior right. Whenever practicable, the signature of the conductor of the train of superior right must be taken to the order and "complete" given before the train of inferior right is allowed to act on it.

After "O K" has been given and acknowledged, and **before** "complete" has been given, the order must be treated as a holding order for the train addressed, but must not be otherwise acted on until "complete" has been given.

If the line fails **before an office has received and acknowledged** "*O K*" to an order preceded by the signal "31" the order at that office is of no effect, and must be there treated as if it had not been sent.

[NOTE.—On roads where the signature of the engineman and pilot is desired, the words "engineman and pilot" may be added after the word "conductor" in the first paragraph of Rule 510.]

511. When an order has been transmitted, preceded by the signal "19," operators receiving it must (unless otherwise directed) repeat it back at once from the manifold copy, and in the succession in which the several offices have been addressed. Each operator repeating must observe whether the others repeat correctly. After the order has been repeated correctly, the response "complete," with the Superintendent's initials, will be given, when authorized by the train dispatcher. Each operator receiving this response must write on each copy the word "complete," the time, and his last name in full, and reply "I complete" with his office signal, and will personally deliver the order to the persons addressed without taking their signatures.

[NOTE.—On roads where it is desired the signatures of the conductors (or conductors, enginemen and pilots) may be taken by the operator on the delivery of the order. See also note under Rule 500.]

512. For an order preceded by the signal "19," "com-

plete" must be given and acknowledged for the train of superior right before it is given for the train of inferior right.

If the line fails **before an office has received and acknowledged the "complete"** to an order, preceded by the signal "19," the order at that office is of no effect, and must be treated as if it had not been sent.

513. The order, the "O. K." and the "complete" must each, in transmitting, be preceded by "31" or "19," as the case may be, and the number of the order, thus, "31, No. 10," or "19, No. 10." In transmitting the signature of a conductor it must be preceded by "31," the number of the order, and the train number, thus, "31, No. 10, Train No. 5." After each transmission and response the sending operator must give his office signal.

514. The operator who receives and delivers an order must preserve the lowest copy. On this must appear the signatures of those who sign for the order, and on it he must record the time when he receives it; the responses; the time when they are received; his own name; the date; and the train number, for which places are provided in the blanks. These copies must be sent to the Superintendent.

[See note under Rule 500.]

515. For orders delivered at the Superintendent's office the requirements as to record and delivery will be the same as at other points.

[See note under Rule 500.]

516. Orders to persons in charge of work requiring the use of track in yards or at other points, authorizing such use when trains are late, must be delivered in the same way as to conductors of trains.

517. An order to be delivered to a train at a point not a telegraph station, or while the office is closed, must be addressed to

"*C. and E., No.* —— (*at* ——), *care of* ——,"

and forwarded and delivered by the conductor or other person in whose care it is addressed. "Complete" will be given upon the signature of the person by whom the order is to be delivered, who must be supplied with copies for the conductor and engineman addressed, and a copy upon which he shall take their signatures. This copy he must deliver to the first operator accessible, who must preserve it, and at once advise the train dispatcher of its having been received.

Orders so delivered to a train must be compared by those receiving them with the copy held by the person delivering and acted on as if "complete" had been given in the ordinary way.

Orders must not be sent in the manner herein provided to trains the rights of which are thereby restricted.

[See note under Rule 510.]

518. When a train is named in an order, all its sections are included unless particular sections are specified, and each section included must have copies addressed and delivered to it.

519. Meeting orders must not be sent for delivery to trains at the meeting point if it can be avoided. When it cannot be avoided, special precautions must be taken by the train dispatchers and operators to insure safety.

There should be, if possible, at least one telegraph office between those at which opposing trains receive meeting orders.

Orders should not be sent an unnecessarily long time before delivery, or to points unnecessarily distant from where they are to be executed. No orders (except those affecting the train at that point) should be delivered to a freight train at a station where it has much work until after the work is done.

520. A train, or any section of a train, must be governed strictly by the terms of orders addressed to it, and must not assume rights not conferred by such orders. In all other respects it must be governed by the Train Rules and Time-table.

521. Orders once in effect continue so until fulfilled, superseded or annulled. Orders held by or issued for a regular train which has lost its rights, as provided by Rule 107, are annulled, and other trains will be governed accordingly.

522 (A). A fixed signal must be used at each train-order office, which shall display red at all times when there is an operator on duty, except when changed to white to allow a train to pass after getting orders, or for which there are no orders.

When red is displayed, all trains must come to a full stop, and not proceed as long as red is displayed. The signal must be returned to red as soon as a train has passed. It must only be fastened at white when no operator is on duty. This signal must also display red to hold trains running in the same direction the required time apart. Operators must be prepared with other signals to use promptly if the fixed signal should fail to work properly. If a signal is not displayed at a night office, trains which have not been previously notified must stop and inquire the cause, and report the facts to the Superintendent from the next open telegraph office.

When a semaphore is used, the arm means red when horizontal and white when in an inclined position.

522 (B). A fixed signal must be used at each train-order office, which shall display red when trains are to be stopped for orders. When there are no orders the signal must display white.

When an operator receives the signal "31," or "19," he must **immediately** display red, and **then** reply "red displayed." The signal must not be changed to white until the object for which red is displayed is accomplished.

While the red is displayed, all trains must come to a full stop, and any train thus stopped must not proceed without an order addressed to such train, or a clearance card on a specified form, stating, over the operator's signature, that he has no orders for it. Operators must be prepared with other signals to use promptly if the fixed signal should fail to work properly. If a signal is not displayed at a night office, trains which have not been previously notified must stop and inquire the cause, and report the facts to the Superintendent from the next open telegraph office.

When a semaphore is used, the arm means red when horizontal and white when in an inclined position.

[NOTE.—The Committee has recommended two forms of Rule 522, leaving it discretionary with the roads to adopt one or both of these forms according to the circumstances of their traffic.]

523. Operators will promptly record and report to the Superintendent the time of departure of all trains and the direction in which extra trains are moving. They will record the arriving time of trains and report it when so directed.

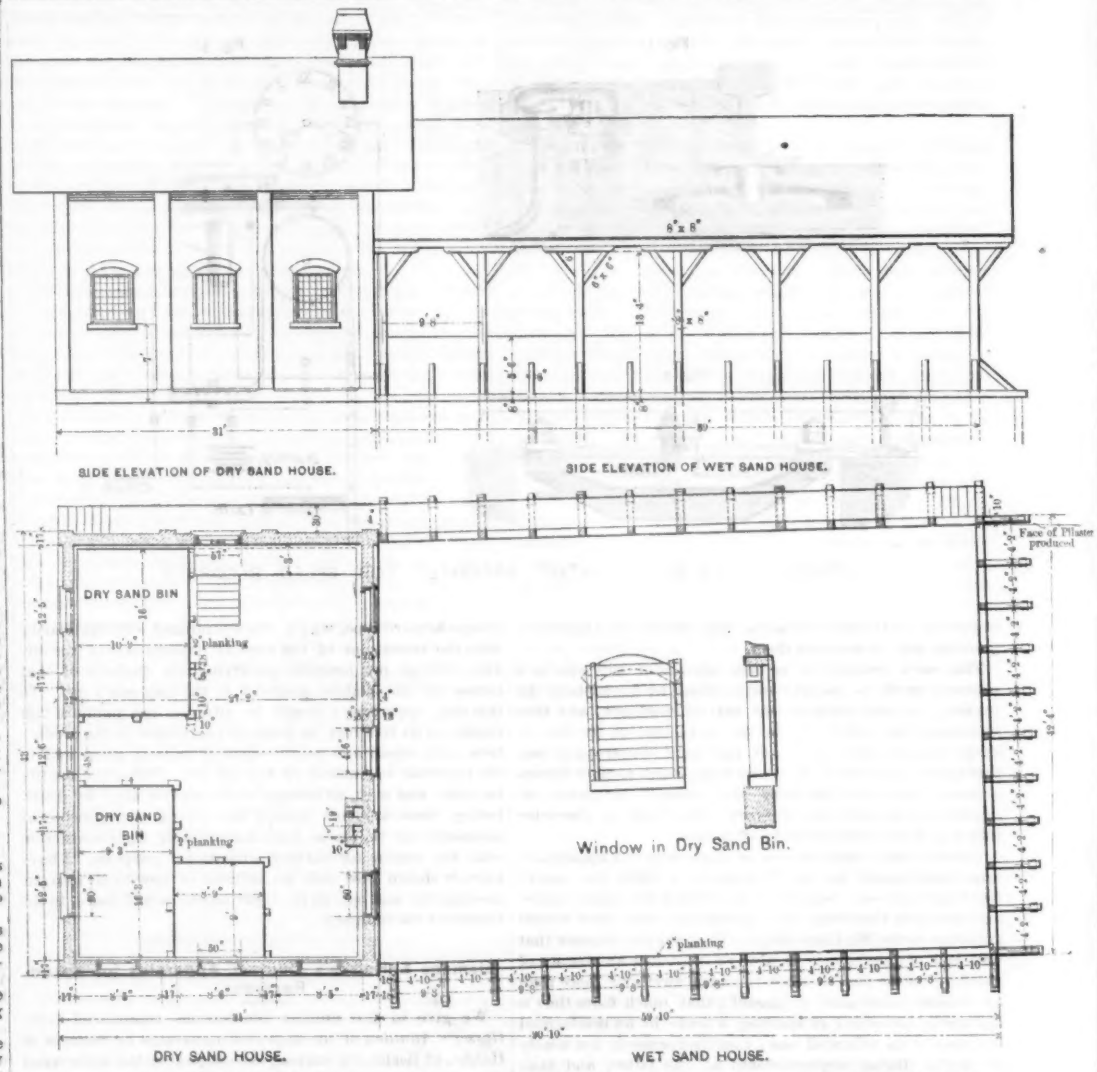
[See note under Rule 500.]

524. Regular trains will be designated in orders by their schedule numbers, as "No. 10," or "2d No. 10," adding engine numbers if desired; extra trains by engine numbers, as "Extra 798;" and all other numbers by figures. The direction of the movement of extras will be added when necessary, as "East" or "West." Time will be stated in figures only.

[NOTE.—In case any roads desire to state time in words as well as figures, the Committee sees no objection to their doing so.]

525. The following signs and abbreviations may be used:

Initials for Superintendent's signature.



SAND HOUSE—COLUMBUS SHOPS, PITTSBURGH, CINCINNATI & ST. LOUIS RAILWAY.

Such office and other signals as are arranged by the Superintendent.

[See note under Rule 500.]

C & E—for Conductor and Engineman.
O K—as provided in these rules.
Min—for Minutes.
Junc—for Junction.
Frt—for Freight.
No—for Number.
Eng—for Engine.
Sec—for Section.
Opr—for Operator.
9—to clear the line for Train Orders, and for Operators to ask for Train Orders.
31 and 19—for Train Order, as provided in the rules.

The usual abbreviations for the names of the months and stations.

526. Orders used by conductors must be sent by them, daily, to the Superintendent.

527. Enginemen will place their orders in the clip before them until executed.

The forms of orders with the committee's notes thereon are omitted from lack of space, and will be given in a future number.

New England Railroad Club

LIGHTING OF PASSENGER CARS.

The regular monthly meeting of the club was held on the evening of the 13th inst., President Lauder in the chair, 65 members present.

The PRESIDENT: There seems to be a craze just now on the subject of heating and lighting cars, and a demand for something different from what is in use. We have on exhibition in the corner of the room an illustration of the Pintsch system. In connection with electric lighting the cost of existing systems is an interesting question. I will ask Mr. Adams if he can give us any information on that point concerning the Julien system.

Mr. ADAMS: I don't think any one is prepared to give figures with any definiteness.

Gov. HOWARD (representing the Pintsch system): Through the kindness of the Boston & Albany we have an exhibit here to-night, as you will see. The difficulty which Mr. Pintsch experienced for some twelve years was to get an efficient governor, which requires a diaphragm to stand the vibration of the cars. A diaphragm is necessary in order to render the elasticity of the gas uniform; after a long time he accomplished this by means of hide prepared with some oleaginous material. It has a greasy feeling to the touch, and it remains continuously the same, without variation. And that is what constitutes the marked difference between the Pintsch and other systems using compressed gas. In all other systems they are obliged to oil the diaphragm occasionally, and it follows that it never remains the same, but is constantly varying. The lamp which will be ultimately adopted in this country probably will not be like these shown here. This style is only a concession to the weakness of humanity, as people think that a car is not well lighted unless some light is thrown on the ceiling, whereas the object should be to throw the light downward where it is needed. We are making arrangements to introduce a lamp somewhat different from this. As to danger of explosion, all know that gas cannot explode unless it is out in the atmosphere; it cannot explode in a receptacle. An explosion of gas may take place in a very close room, but cannot in a car where there is constant ventilation by the opening of doors, moving of the train, etc. Now, there are nearly 25,000 cars lighted in this way, it has been adopted by a hundred different companies, and there has never been an accident from it. In case of collision our calculation is that gas will be shut off. There is no opportunity for it to escape, outside or inside. The gas is carried under the car, in a receptacle made of steel.

It is necessary that the workmanship upon the apparatus should be of a high order. There are five factories in different parts of Germany in this business. Mr. Stroudley, who stands very high in railroad matters in England, has given up an electric system which he had in contemplation for car lighting and applied to the Pintsch company for the introduction of its system; and it is continually extending on the continent, showing the confidence which is there felt in it.

The cost of this light, after the car is fitted with the apparatus, is about $12 per car per year. It has four times the illuminating power of coal gas. Most of the roads that use this gas also light their yards and their various buildings with it, thus saving enough over what they formerly paid to more than cover the cost of the works and fittings, but even if that use was not made of the gas, in no case would the cost of lighting exceed $40 per year per car, including everything in the way of plant and fitting. Of course the first question is as to safety, and we have the testimony of the highest experts in this country that they regard it as absolutely safe. With regard to oil, where a 300° fire test is required, I doubt if there is a railroad in New England but what is violating the law. The more you refine this oil, the poorer it is for burning, and when you get up to 300° it is pretty poor. In order to get a good light the tendency is to refine it less. I doubt if there is any oil in the market that does comply with the law. It has been stated that the oil that is burned in our cars will put out fire. That is true, I have proved it by experiment; but it is a different thing where upholstery is saturated with it, where every little fibre is a wick, so nothing is proved in its favor when you show that it will put out fire if dashed upon it.

Mr. ADAMS: How are we to know that we are violating the law, or complying with it, in burning 300° fire test oil?

Gov. HOWARD: You have a State inspector of kerosene.

Mr. ADAMS: The oil used by our company is bought under the inspection of a Government officer who puts his mark upon it, and guarantees it to be 300° fire test. I have bought a good many barrels and taken pains to get the Government's certificate for it.

Gov. HOWARD: The Government inspector does not examine all the oil; he only inspects occasionally.

Mr. ADAMS: The inspection marks are put upon every barrel by the Government inspector.

Mr. CURTIS: The Downer Co. will furnish a certificate with each barrel. I took a sample to the Institute of Technology and had it tested, and it passed inspection there. That was ten years ago.

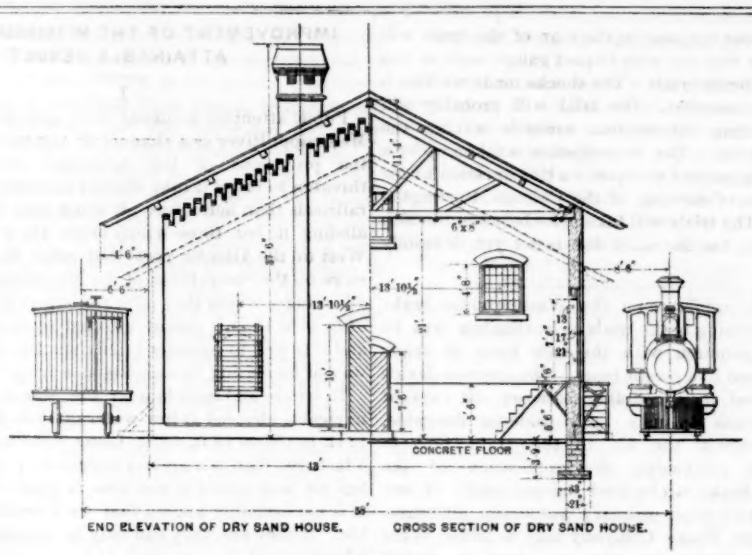
Mr. CONEY: Is that carbureted hydrogen which Gov. Howard is burning?

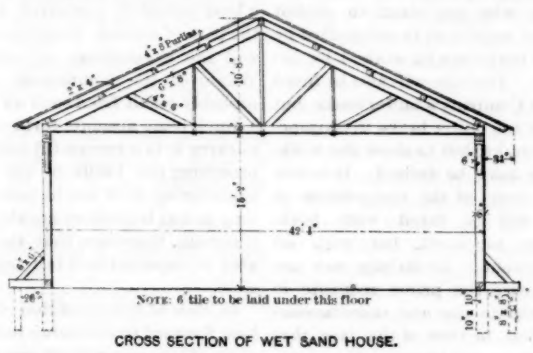
Mr. DIXON: It is carbureted hydrogen. It is heavier than coal gas, lighter than air.

Mr. CONEY: Have the lighter portions of petroleum been taken away from it?

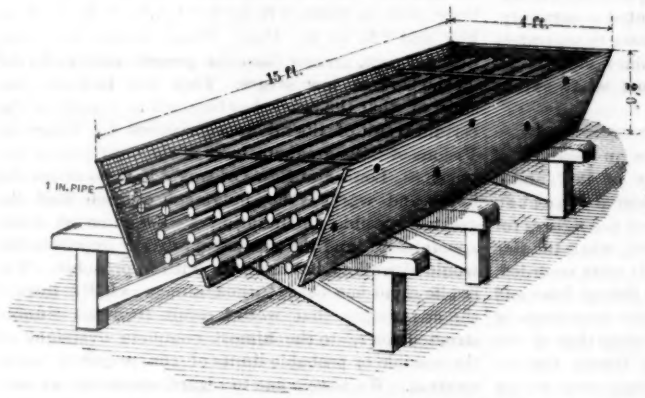
Mr. DIXON: No, sir, decomposed into a permanent gas.

Mr. CONEY: I spent some six years in the oil country, built two or three large refineries in the United States, was also with Downer, of South Boston, for a while, and I question very much whether you will find much oil that will stand 300° fire test by the best instruments made. I have tested many thousand barrels of oil in the oil country and in

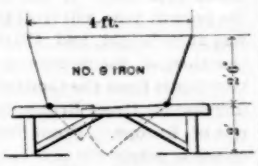




CROSS SECTION OF WET SAND HOUSE.



Trough for Drying Sand —Elevation, End Removed.



Cross Section.

SAND HOUSE—COLUMBUS SHOPS, PITTSBURGH, CINCINNATI & ST. LOUIS RAILWAY.

Pennsylvania and in this city. Any person as well posted as I was might make a mistake of 10° to 30°. We have tested many thousand samples marked 300°, but I have seen but very few that stood 300° fire test. There is a good deal of oil made in South Boston to-day called 300° that will not go much over 225°. When kerosene was first put into head-lights we burned them up, because we had the same space for kerosene wicks as for oil wicks. Mr. Hall introduced a smaller wick, and that succeeded better, and gave a pure white light. The 300° fire test oil is from a peculiar part of the still; it is the cream of the oil, very fine, out of the middle of the run; and it will burn beautifully without any subsequent treatment. I have seen oil off color that you could not sell in the market, that would give a better photometric test than any oil in the market. Do you consider this gas in the Pintsch system a practically permanent gas?

Mr. DIXON: Yes, sir; absolutely permanent. This which is in the tank here was put in a week ago to-day. There is a certain amount of drip to it, but by compression all this drip is liquefied. The gas is neither affected by cold or heat; it is a pure orthodox gas. It loses about 6 per cent. from compression; that is taken away in the form of a liquid; we have traps for that purpose.

The PRESIDENT: Speaking of oil, I had supposed that the higher the test the poorer the oil for burning purposes and illumination; but if what Mr. Coney says is true, which I do not doubt, it is very gratifying, and may be a help to others.

Mr. CONEY: The only reason 300° does not burn well is that it has not the capillary attraction that the lighter oil has. If you can get the oil on to the wick you can get as large a flame and as good combustion. The font of the lamp should not be over two inches deep. This oil will burn if you give it a proper amount of oxygen, and without smoking, and give a whiter light than the lighter oils will. The flame of a head-light fed with this oil is very white; and I don't know of any reason why it should not give as good a light as the other oils. I would not care for any oil to burn in my own house over 125°. I don't believe an accident ever happened with good petroleum oil in your head-lights, with proper wick space and burner properly adjusted.

The PRESIDENT: The present system of car lighting is a very good one. It has done us good service, and we can get all the light we want, simply by putting in lamps enough. There is only one objection to more lamps, and that is they give more heat in the car, an objection that does not pertain to electricity, or not to the same extent. Our present system is good and economical, and it will not do to abandon it until something is shown us that is well worked up and we know is all right. We don't want to abandon a good system for an uncertainty. I think that lamps can be put into a car to burn 300° or 200° fire test oil, that are just as safe as anything else. The lamps in our cars will go out if the cars get a hard bump in switching. If a lamp is broken and the oil is scattered, and a car takes fire, this adds fuel to the flame; but with proper lamps and oil it would not be possible to set the car on fire from them. It is going to cost something over $1,000 a car to light with electricity as it exists to-day, which makes it impracticable to any extent. Some cars we are building now will have 5 oil lamps each, and each lamp 4 burners. We think they will light the cars well, and there will be, of course, more heat from them than with a less number, but if the cars are properly ventilated I don't think any inconvenience will arise from that.

Mr. HUMPHREYS: The Pintsch is a thorough system from one end to the other; every detail has been carefully worked out. The amount of gas consumed per hour in these lamps is surprisingly small. The one on the right burns about 2½ ft. per hour, and the light is equal to a candle power of about 40, whereas coal gas or ordinary illuminating gas for city use is consumed at the rate of 5 ft. per hour, and runs from 16 to 32 cand'e-power. There is no diluent in this gas; it is simply a distillation from oil alone. If you analyze you will find diluents, but there are none introduced, nothing but what the oil will naturally carry there. You don't want to compress gas at ruinous rates to get enough to carry you to Chicago and back; but that trip can be made with this gas, consuming only 2½ ft. per hour. The gas itself when compressed is about 45 to 50 candle-power. You get a greater amount of light by regeneration, but if that is carried to an extreme it will require a complicated lamp and make trouble. There is no complication in the apparatus on the cars, and an ordinary car-tender can take care of it.

Mr. SNOW: An instance occurred a few years ago in Canada, where a sleeping car was hitched on to a freight train, where there was no bell cord. One of the lamps in the car exploded, and burned up the car, and most of the passengers in it. This I remember very well.

Mr. TYLER: Insufficient light often results from the brakemen not turning up the lights as high as they might. In many cars lights are placed too high to be of any service to the passenger in reading. The New York Central has recently had lamps placed ten inches lower than before, and the difference in the light is very marked; one can read without difficulty. With regard to the effect of concussion in extinguishing lights, I was once traveling in Eastern Kentucky when a man was lynched on board the train by having bullets fired into him. The moment the shots were fired every light in the car went out.

Mr. WHEELER: I represent a reflector system. We have within two weeks fitted reflectors for electric lighting by primary batteries. We have a car on the New York Central being made ready for a test, and another on the Delaware & Hudson Canal Co.'s road, in each of which there are ten burners. With the Julien system of electric lighting, I believe 20 lamps to a car are required to give the desired light. I have no hesitation in saying that with our reflectors we can with 12 lamps furnish 50 per cent. more light than the 20 lamps without them will produce, and so a large proportion of the expense of lighting can be saved. Referring to the lamps that Mr. Lauder mentioned, 20 burners to a car, I would say that with five oil lamps, with two burners each, in a 60-ft. car, we will guarantee, with our reflectors, to furnish as much light as he will have with his 20 burners; that is, to give a brilliant illumination in every seat in the car, so that persons can see to read easily. We manufacture over 100 different styles and shapes of reflectors.

Mr. LEWIS remarked that reflectors were successfully used in street cars, and that the reason lamps with a large quantity of metal preventing radiation of light are still used is that railroad men do not demand better ones.

Mr. CONEY: Can anybody give us any definite information about the difference between reflected light and that which you get directly from the flame? I once made an experiment to light a room in an oil refinery, where we could not have any light, by putting at the end of the building a pane of glass 6 ft. long, and a reflector of same length, filled it full of headlight burners, so that every portion of that reflector was full of light, and there was a pillar of light in front of that window the length of the room. The consequence was that the men could see to fill the cans in every part of the room. If there had been a dozen of these lights round the room, without the reflector, I think they could not have seen as well. Now, is light a body, and must it be treated as such? If light is a body, it is dissipated in the atmosphere; it goes a certain distance and is lost. Is it proper to treat light as a body, and after it leaves the burner where does it go? Is it absorbed by the atmosphere, or what becomes of it?

Mr. WHEELER: We know that light decreases in intensity as you go away from it inversely as the square of the distance. Whether light is a body I cannot say. In all our reflectors we use the best quality of German mirror silver-plated glass, in which each individual reflection of the flame is 95 per cent. as strong as the original light itself; and with such reflectors as we put into cars we get a light four or five times as strong as the light to which it is applied. With five oil lamps in each car, one can see to read anywhere in the car. We have had reflectors on the Northern road for three years; and I asked the officers within a month if they regarded them as favorably as at first, and I find they do. Mr. Adams had one or two cars fitted with them two or three years ago, and there was difficulty with them, but it was entirely mechanical, and perhaps also in the fact that they did to some extent darken the car at the top. Mr. Wheeler in answer to criticism said: We cannot attempt to light the whole car with three double lamps. With five double lamps I think that criticism would entirely disappear. The trouble was that you saw a contrast between the field of reflection and the space outside the field of reflection.

Mr. MARDEN: We have recently put into one car five double lamps with the Acme burner, and that is perhaps the best lighted car that goes out of Boston to-day, except Mr. Adams' car lighted by electricity. In saying this, I yet believe in electricity as the coming light, and we are fitting up one car, in which we shall probably put 10 or 12 burners, for electric lighting; the cost of fitting, outside of what we do ourselves, is $375, including the batteries and all the appliances. The railroad company is to make the box to hold the batteries.

Mr. WHEELER: To fit up a car such as Mr. Lauder has spoken of, containing five double oil lamps, with reflectors and proper attachments, would cost $25 only.

Mr. MARDEN: While we would accept a light that would give the passenger a chance to read, even if we were obliged to darken the roof of a car, yet I think a light diffused through the whole car is more pleasant. There are many cars with dark head-linings, which seem to absorb the light. A car with light head-linings and wholly illuminated would be more desirable than one where the top was not lighted.

Mr. WHEELER: Every lamp contributes to the lighting of the upper part of the car, except the space immediately above.

Mr. HAYES: I have here an arrangement for the extinguishing of lamps. It is an attachment which can be placed upon the car lamps in ordinary use with very little expense. It is a ball filled with lead, which can be placed on the ends of the tubes, so that if the car tips at any angle over 45°, the ball is sure to roll down and put out the light. If the car rolls in any way or is telescoped, the ball will act and extinguish the light.

The PRESIDENT announced as the subject for discussion at the next meeting, Axle Bearings, Dust Guards and Lubrication.

Sand Store, Pittsburgh, Cincinnati & St. Louis.

The accompanying illustrations represent the method adopted for drying sand for use on locomotives at the Pittsburgh, Cincinnati & St. Louis shops at Columbus. The methods adopted differ in several essential particles from those generally used. The wet sand is stored under a roof, and is consequently protected from being further wetted by rain. The sides of this building are formed of stout planking for a few feet from the floor, so that the sand can be piled some four feet deep. Movable shutters are provided above the fixed sides, and can be opened in fine weather, so as to admit sunshine and air to dry the upper surface of the sand. In wet weather the shutters can be closed. The floor is formed of loose bricks set on edge, with tile drains underneath. Provision is thus made for naturally drying the sand before any artificial heat is applied.

In the usual method of heaping the sand in the open air it is simply shoveled into the furnace or heater as wanted, and the wettest portion of the sand is liable to be taken. At Columbus the upper and dryest part of the sand is used first, and is taken through suitable openings into the adjoining stove for dry sand. The wet sand store is large enough to hold a supply for the four winter months, during which the average consumption is about 17 car loads per month. Each car load weighs about 15 tons, so that the total capacity is about 1,000 tons of sand.

The dry sand store is built of brick, with a cement floor. It contains space for two sand dryers and bins for dry sand. The sand dryers consist of a wrought-iron hopper tapering smaller toward the bottom. The hopper is traversed by several rows of steam pipes, placed in rows 2½ inches apart, as shown in accompanying illustration. The wet sand is thrown on the top of these pipes and while it sticks to the pipes while wet, gradually falls through as it dries.

A platform runs along one side of the dry sandhouse. The engines come alongside this platform and receive their sand. The platform is sufficiently long to enable two engines to receive sand at one time.

RAILROAD GAZETTE

Published Every Friday,
At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The Iowa Railroad Commissioners' report for 1886 contains a classified summary of car-coupling accidents for the past 9 years, showing that during that time in the state of Iowa 131 employés have been killed and 965 severely injured. In the *Railroad Gazette* for September 25, 1885, careful and elaborate computations were made from the best attainable data, and the following conclusions were arrived at as being the *probable* annual slaughter of employés in the United States:

	Killed.	Severely injured.	Total.	Ratio of killed to injured.
In coupling cars	459	4,073	4,532	1 to 8.9

"The indications are, as we have already seen, that the slighter injuries would bring up the ratio of injured to killed to something like that in the Baltimore & Ohio and Lake Shore experience. Doing this, and distributing the various injuries, as respects their nature and severity, about in the proportion of the Baltimore & Ohio experience, we obtain as the appalling totals of the apparent annual injuries to employés from coupling cars in the United States, 459 killed, 4,073 severely injured and 13,770 not seriously injured, or **18,302** in all—one-half more than the casualties to the United States army in the great battle of the Wilderness, though the number killed is not one-fourth as great."

This terrible and unnecessary loss of life must be lessened. The executive committee of the Master Car Builders' Association have accomplished much in reducing the number of competing couplers, but it is reserved for the railroad companies to take the matter in hand, to select from them some single coupler or a combination of them into a single device. The complications due to separate state action, and the probably illegal prescriptions of different couplers in different states, do not diminish, but greatly increase, the dangers of car coupling. At a private meeting of a number of railroad managers a few months since this problem was discussed, and a man of national—world-wide—reputation among railroad men was asked to predict the solution. Said he: "The matter will be solved very quickly when the railroad companies are willing to combine in forming a pool or corporation." Done in a proper way, this is a rational and perhaps the only possible immediate solution.

The Chicago, Burlington & Quincy are about to make some interesting trials with a variety of car couplers. Instead of trying the couplers on two cars in a yard, Mr. G. W. Rhodes proposes to take a train of from 30 to 36 empty freight cars fitted up with various types of automatic couplers that have been in experimental use on the Chicago, Burlington & Quincy, and make emergency stops over the brake course at Burlington. In addition to close couplers, the Ames coupler and the Perry link and pin will be used, and some tests will probably be made with various lengths of links. The train will be fitted with a dynamometer car, and on the rear of the train will be attached a way car with impact gauge, such as was used at the brake trials. The shocks made with each stop will be recorded. The trial will probably add some interesting information towards solving the coupler problem. The investigation is taken up by a committee appointed to report on this question to the Superintendents' meeting of the Chicago, Burlington & Quincy. The trials will take place between the 20th and 30th inst., but the exact date is not yet definitely settled.

The electric appliance on the Westinghouse brake at the forthcoming brake trials at Burlington will be used in conjunction with the new form of triple valve described in a recent issue. The electric device will be placed in a coupling between the cars at as many points as may be considered desirable, and will permit the air in the train pipe to escape, thus quickening the application of the brake. The brake can be used independently of any electrical device as an ordinary automatic air-brake. The American Brake Company may be added to the list of brake companies who are about to exhibit at Burlington an air brake capable of being applied by an electric current. The brake can be worked by air alone without electricity. The cars will also be fitted with the American Brake Company's buffer brake, but it is not proposed to work the buffer brake in conjunction with the electric air brake, but to show the working of either brake as may be desired. It is now probable that at least four of the competitors at the May brake trials will be fitted with braking apparatus complete in itself, but with an auxiliary electric attachment. Electricity can undoubtedly be made to secure the prime requisite in long train braking—instantaneous and simultaneous application on each car—but, in view of the fact that the laws governing its use are still imperfectly known, and occasional failure may be accounted a certainty, it will surely be wise for the committee to separately test these brakes without the auxiliary electric attachment in order to ascertain to just what extent they are efficient without it.

The records of Castle Garden show an increase of 15,000 emigrants for the first quarter of 1887, and it is not improbable that we are to receive as great an influx as in 1883. It may even be that the figures for the present year will rival those of 1882, when the tide was at its height, and 476,000 arrivals were recorded. One-third of the increase is from the British Isles and two-thirds from the Continent; but the percentage of increase for Great Britain is nearly double that of the rest of Europe. From Ireland and Russia the increase is nearly 100 per cent., from Italy over 60 per cent. There was no increase from Sweden and Norway during the first quarter, but the daily arrivals indicate that for the second quarter it will reach a high figure. From Germany the increase is greater than from Austria or Hungary, and was very large for the month of March. As passenger traffic, it is noteworthy that a larger body than usual is for distant points. It appears to be well understood in Europe that the East offers few opportunities compared with the West. The cause of the increase is, without doubt, the general prosperity of the country.

Considerable space is given in this issue to Dr. Barnard's report, made to the President of the Baltimore & Ohio, on the subject of technical education. The abstract which we present is sufficient to show the scope of the work undertaken by the company, and to indicate the extent of Dr. Barnard's study of the general subject. The Baltimore & Ohio has made a very important step forward, whether it is considered in reference to railroad administration alone, or to education and industry in general. The necessity of increasing net earnings is more and more pressing. The relations of employer and employé are becoming more complicated and unstable. The discontent of the very ignorant, and of those "educated" in the public schools to read, write, and talk increases. *Real education*, such as actually fits a man to do something well in his place will no doubt be found to come nearer to a general remedy for all these "present discontents" than any other one thing. That this is not what the genial Tom Allen would have called a "blanked barren ideality" is abundantly shown by the European instances cited in the report. There is no question that a corporation will get better and cheaper service, and happier and more contented employés, by careful training of selected youths, and the benefit to the nation of the general adoption by the great corporations of a policy like that which the Baltimore & Ohio has now undertaken can hardly be overestimated.

IMPROVEMENT OF THE MISSISSIPPI—THE ATTAINABLE RESULT.

I.

Public attention is turned with new interest to the Mississippi River as a channel of commerce, now that the provisions of the Inter-state Commerce law threaten to bring it into sharper competition with the railroads than heretofore. It is not only the roads paralleling it, but those which bring the product of the West to the Atlantic ports that must in future count more on the competition of the Mississippi, if the great advantages which they offer for export trade are hereafter to be to any extent affected by increased rates; and it is well to consider briefly what is possible in the way of increasing its capacity as a freight carrier.

To secure and maintain on the Mississippi River a navigable channel at low water of 15 ft. to Vicksburg, 12 ft. to Cairo, 10 ft. to St. Louis, 8 ft. to Keokuk and 5 ft. to St. Paul is a greater engineering problem than has yet been solved at any time or place on this planet. It is not certainly known that such results are possible. If they are, they can only be accomplished after a long period of concerted and consistent action on the part of various departments of the government, and the expenditure of enormous sums of money. Whatever the commercial advantages that would probably result from such an improvement, it requires a much more absolute form of government than ours to carry it to a successful completion. Anything approaching the limits of the possible in government engineering must not be looked for in this country so long as our legislators are also our chief engineers. It is certain, therefore, that the best that may reasonably be expected will fall very far short of the possible.

In view of this condition of things it is irrational to look forward to obtaining in the next half century an assured low water depth greater than 12 ft. to Vicksburg, 10 ft. to Cairo, 8 ft. to St. Louis, 5 ft. to Keokuk, and 3 ft. to St. Paul. These depths are about fifty per cent. greater than the present ruling depths on the bars at low stages. They are, however, far short of what the public has been led to expect as the certain result of liberal appropriations by Congress. Visions of "the great steamers of the Gulf plying between St. Louis and New Orleans"* have so raised the hopes and warped the judgment of men that the greatest possible amelioration would come as a disappointment, and the greatest probable improvement would doubtless be received with reproaches. The public mind has been turned almost wholly toward the advantages that would result from an "unobstructed river," to the almost complete oversight of the possible or probable limits of the proposed amelioration. We have come to regard engineers as omnipotent when supplied with the requisite means. The people have thought that if they procure from Congress the funds, engineers would certainly be able to skim off the tops of a few sand bars! So many of the forces of nature have been subdued and brought into the service of man that it seems but a small thing to demand of gravity to remove from the tops of these bars a small percentage of the material it has deposited there.

But the analogy may not hold. In spanning rivers, tunneling mountains, and severing continents, we are dealing with fixed and inert matter which, when once moved or put in place, has no power within or without itself to change its status. Here it is only a question of time, money, and wise engineering. The treatment of the Mississippi River, however, differs as much from such problems as these, as the management of a child should differ from that of a doll. As compared with tunnels, canals, railroads, and bridges, the Mississippi River is a living, sentient creature, of giant power and of a fierce and turbulent disposition, apparently as erratic and lawless as a streak of chain lightning, but which, like all other phenomena in nature, is working in perfect and exact accord with the numerous forces and laws which act and react upon it. These laws are, of course, unchangeable, but the reacting forces may be modified, and then the river adapts itself to the new conditions, and within the limits of these changes is as tractable and subservient as clay in the hands of the potter. But the utmost limit of human agency is so soon reached in the case of the Mississippi River that the resulting changes will necessarily appear small to those who have been predicting the impossible.

The statements made above will appear to most people so startling that it will be necessary to adduce some proof of their truth.

Between Cairo and New Orleans there has been

* Speech of Hon. W. S. Shallenberger, M. C., before the Mississippi River Improvement Convention, St. Louis, Oct. 28, 1881.

spent, in the last six years, about $8,000,000, nearly all of which has been given to the improvement of some seventy miles of river, at two points. The upper section is called the Plum Point Reach, being between Cairo and Memphis, and the lower one, just above Vicksburg, is called the Lake Providence Reach. It is true that the improvement works on these reaches have not been entirely completed, owing to a failure in the appropriation in 1883 and 1885; but for a considerable portion of each of these stretches of river the contraction works, which are the main reliance in deepening the channel over the bars, have been fairly complete, and have accomplished their purpose about as fully as such works are ever likely to do. The low water width has been successfully confined within shore lines, some 3,000 feet apart, and whatever deepening of channel is likely to result from such confinement has resulted.

On the Stack Island crossing in the improved portion of the Lake Providence Reach the minimum depth in 1885, at a stage 5.5 ft. above extreme low water, was 14 ft.

On the Bullerton Bar, in the midst of the Plum Point Reach, the lowest water in 1885 was 8.5 ft. at a stage of river 9 ft. above low water.

On the 22 miles of improved channel below St. Louis, the minimum depth in 1885 (stage not given) was 8 ft.

From the mouth of the Illinois River to the Des Moines Rapids (Keokuk) the improved sections of the river give a depth of 4.5 ft. at extreme low water.

From the Des Moines Rapids to St. Paul the improved portions of the river show a minimum depth of 3 ft. at extreme low water.

The expenditures on the river above Cairo since 1878 have been :

Mouth of the Ohio to the mouth of the Illinois	$3,350,000
Mouth of the Illinois to the Des Moines Rapids	815,000
Des Moines Rapids to St. Paul	1,200,000
Total expenditure in the upper river	$5,365,000
" " " lower river	8,000,000
Total expenditure on the Miss. River since 1878	$13,365,000

The portion of the entire river now improved to the extent indicated above is comparatively small. To obtain these modest results upon the entire length of river from New Orleans to St. Paul will cost at least $100,000,000, even though the improving of a section lower down the stream should not destroy the effects obtained higher up. But this is just the element of greatest uncertainty in the problem. It is not a difficult matter to cut a navigable channel through one sand bar, but when all the bars in the river are cut down the same amount, we find that the whole water surface has been lowered by nearly the same amount, and hence the depth of water over the bars is not very much increased.

The Mississippi River, like all streams flowing in alluvial beds, consists of a succession of deep pools separated by high dams. In the case of the lower Mississippi River these dams will average about fifty feet high, each successive crest being some four or five feet below the preceding one. Let us take a series of six such crests, being some twelve or fifteen miles apart. If the crest farthest up stream is cut down say three feet this will give a good channel until the next bar below is cut out, when the intervening pool is lowered and the upper bar again becomes troublesome. In this way the removal of any one of the series is apt to shoal the water on the bars immediately above. This is the *bête noir* of all river improvements. It is the one rock on which almost all river improvement schemes in Europe have stranded. There is but one way to prevent this result. That is to deepen the channel across the bar for *such a width only* as will pass the low water volume *with the same slope across the bar* as was required with the original wide and shallow channel. In this case the pool above will not be lowered, and improvements obtained above will not be disturbed. To any one acquainted with the shifting, treacherous nature of the beds of such streams as the Mississippi, the accomplishment of this delicate adjustment would seem well nigh impossible. We may therefore say with certainty that improvements on one section will always affect more or less the conditions already attained above and below, and hence this exceedingly uncertain element in the problem is inherent in it and cannot be eliminated.

So far as experience may be used as a guide, therefore, no greater depths than those stated as probably attainable can be anticipated from the methods now in use. In a succeeding article we will undertake to show why greater depths on bars are unattainable by these methods, and also that these are the only methods available for the Mississippi River.

DIFFICULTIES OF NATIONAL LEGISLATION.

If any one expected to make political capital out of his support of the Inter-state Commerce bill, he has found himself grievously disappointed. Three weeks' trial has already made it an unpopular measure. People object alike to the enforcement and to the suspension of its provisions. In either case some one is disappointed, and the man who is hurt feels the evil more than the man who is benefited feels the good.

The fault is not so much in this particular measure as in the general attempt to regulate the relations between different shippers by act of Congress. Even when this may prove necessary in the long run, it involves great hardship for the time being. Matters have adjusted themselves to the existing system; it takes time and trouble before they can be readjusted to any other. The principles applied by railroad managers in making rates have been by no means above criticism; but, such as they are, the country is used to them. Business has grown up under a system of special rates. Contracts between producers and dealers have been made on prices such as these railroad charges would permit. Capital has been invested where the low rates could be most readily obtained; it has been so invested in spite of distance from raw material, high rents, or heavy taxes. The low rates at competing points do not by any means go into the pockets of the shippers alone; they are forced to divide profits with others in a hundred different ways.

Now, when the rates for competitive and non-competitive points are brought to the same scale by act of Congress, what happens? The nominal equality which is thus produced means a real inequality. A. has invested his capital in a city where he has had low railroad rates, but high taxes, high rents and high-priced raw materials. B. has invested his capital where raw materials are most easily obtained, where taxes and rents are low, but railroad charges high. The two things balance one another. But force the railroad to put A. and B. on the same level, and you leave A. burdened with his high taxes and rents, and no counter-balancing advantage to show for it.

If the discrimination between A and B has been a purely personal one—that is, if they have been living in the same place and have paid different rates for the same service—there is no hardship in abolishing it. On the contrary, there is reason for so doing. You simply put the two on an equality. But if the two men live in different places, the chances are that the immediate result is to produce more inequality than you abolish. Of course this result will not be permanent. Matters will gradually adjust themselves to the new order of things. Rents will, in the course of time, be reduced at the points which have been deprived of their special advantages. Mercantile business will find a new level of prices. But all this takes time—not weeks or months, but years; and there is danger that by the time the process is well advanced, and the worst hardships over, some one will insist on modifying the law in such a fashion that we must begin over again with a new process of adjustment.

There are three sets of localities which have habitually been charged less than the regular tariff rates.

1. Those which have had the benefit of water competition. Here the railroads did not create the discrimination, but have rather tended to lessen it. The *relative* advantage of Buffalo over Elmira was probably greater before the Erie Railway was built than after.

2. Those like Indianapolis or Atlanta, which have had the benefit of railroad competition, and have grown up under its influence.

3. Those which are so far distant from market that without special rates they cannot ship at all. This is the great reason which prevents the application of a *pro rata* law to any but small sections of the country. Long distance traffic cannot by any means be made to pay equal mileage rates.

The last of these classes is exempt from the operation of the short haul section. Congress itself was wise enough to see that equal mileage rates would stop the movement of Dakota wheat; and the law is so worded as not to affect this traffic very seriously. Its weakness has proved its salvation, because any legislation on the subject would so obviously have killed it.

The first class is also practically exempt, though for a totally different reason. Being able to ship by water, these places are strong enough to be in some sense above the law. It may cause them inconvenience, but it cannot prevent them from getting low rates if they are willing to ship by water. There is a loss of traffic to the railroads, an inconvenience to everybody and no corresponding gain to anybody, except, perhaps, the boatmen. Under these circumstances, the Commission has been urged to exempt such points altogether from the operation of the law, and has taken some steps in that general direction.

But these exceptions make it bear all the more heavily on localities of the second class, places which are neither weak enough nor strong enough to evade the operation of the law. When there was no law at all, Indianapolis and Toledo could compete on terms of substantial equality. When the law applied with equal force to both, water competition might give Toledo a certain measure of advantage. But if the Commission is going to adopt the policy of exempting places which have the benefit of water competition, the relative hardship for places which do not enjoy such privileges will be overwhelming. Any exception which is granted will form the ground for demanding a dozen others. The cases do not stand alone. The question of business prosperity is a question of relative rather than absolute rates.

We are not defending the old system, many of whose effects, direct and indirect, were thoroughly bad. Nor are we quarreling with the underlying principle of the present law. The hardship is in the process of adjustment: the final result, if we can ever reach it, will very likely be beneficial. Any amendment which Congress is likely to pass would probably do quite as much harm as good. A clamor for a radical change in the law is already making itself heard. Let us hope that it may not be too readily heeded. Business can in time adjust itself to a bad law; but not to one which is being constantly tinkered. Among the many evils under which we have suffered, the worst has been the uncertainty of rates. If Congress keeps changing the law on the subject it will be one more element of uncertainty, and in many respects a worse one than any with which we have hitherto had to deal. If we are to have a law, let us have a law; if we are to have it repealed, let us have it repealed; but let us not have it patched up from year to year before we know what it is going to do, or we shall suffer all the possible evil without getting any of the possible good.

The Uniform Code.

The Time Convention at its meeting in New York last week discussed the train rules, and by the decisive vote of 30 to 5 finally adopted the code as considered last October, with a few modifications. The telegraph rules, which were this Spring reported for the first time, were provisionally adopted, and will doubtless be put in force at the same time with the train rules by most of the roads adopting; so that in a short time we shall probably see the whole code in use on a large number of important roads. The discussion at the convention is not yet reported, and we shall therefore refrain from making any extended comments at present. The principal changes aside from verbal improvements and eliminations of unnecessary matter are as follows :

Rules 21 and 22 have been consolidated, and now read—

"21. Upon the time-table not more than two sets of figures are shown for a train at any station.

"The times at regular meeting or passing points are shown in **full-faced type**; other times in ordinary type.

"When two times are shown for a train at any station, the earlier (placed in its proper position) is the arriving time and the later the leaving time.

"When but one time is shown in ordinary type it is the leaving time.

"When but one time is shown in **full-faced type** it is the actual meeting or passing time.

"When both the arriving and leaving times are shown in **full-faced type** it indicates that one or more trains are to be met or passed at or between those times.

"In all cases trains are required to clear and follow as per rules 87 to 92 inclusive.

"[The Committee recommends, in connection with figures in full faced type, that attention be called to the trains that are to be met or passed, by numbers or otherwise]."

Rule 39* was stricken out. Rule 66 (formerly 68 now reads :

"The unnecessary use of the whistle is prohibited; when necessary in shifting at stations and in yards the engine-bell should be rung, and the whistle used only when required by rule or law, or when necessary to prevent accident."

All the rules after No. 21 have their numbers changed, those below 38 being dropped 1 remove and those above it 2; No. 101 becoming 99, etc., and these changes necessitate numerous alterations in the references in the body of the rules.

The dispatching rules, which will be found on another page, although only provisionally adopted are quite sure to stand permanently in substantially the shape they are now in. They conform strictly to the duplicate-order system, and, the whole subject being much simpler than the complex mass of rules in the other portion of the code, and having been considerably discussed in all quarters for several years past, it has naturally come to be better digested than most other points in railroad running, and so provokes less

* "39. When an engine is running backward pulling a train, or without a train, the classification signals as per Rules Nos. 37 and 38 shall be displayed in the places provided for that purpose on the tender. When an engine is pushing cars ahead of it, the classification signals shall be displayed on the front of the leading car which is being pushed."

diffusive criticism, while at the same time it presents such points of difference as do exist in a more decided manner, so that disagreements are more clearly defined and opponents understand each other better.

The gentlemen of the committee showed their good sense by availing themselves of the counsel of Mr. J. A. Anderson, superintendent of the Pennsylvania road's relief department, who was formerly superintendent of a single track road and whose treatise on train dispatching ("The Train-Wire") is the best work there is on the subject. He had done valuable work in this field which no one could improve upon, and the committee has wisely made use of it. Mr. Anderson is to be congratulated upon this recognition of his labors by such a representative body of the most progressive railroad men.

The fact remains that this uniform code is a *basis* rather than a precise form, so that it will be interesting to see the treatment which the alternative rules and the blank spaces receive at the hands of the different roads. The committee had to state some principles which it could not possibly embody in rules for actual use; and in other cases could best show its view concerning a principle by giving the rule which the principle requires, so that the individual roads still have a task demanding time and much care to put the whole body in shape for use. No careless or hurried work can be smuggled in among the almost perfect language of the committee's rules without at once impairing the force of the latter and at the same time showing its own weakness.

It is now greatly to be desired that the whole code shall be enthusiastically put in force by every road in the country. Those who fully and heartily agree with the committee should do this with an earnest intention of justifying the committee's views and standards, and with a view to convincing doubters without delay. The latter, and those who are indifferent, should "give the law a fair trial" so as to have conflicting interests and principles, if such there be, squarely set over against each other without tedious delays and compromises; so that if uniformity is really unattainable in important features, as many claim, the obstacles may be clearly shown and understood by all as soon as possible. If we cannot have one standard, two will be desirable. Even three, or four, would be preferable to no standard or to entire chaos, which may almost be said to be a fair characterization of the old régime.

The committee certainly deserves all the credit that has been accorded to it. Its labors have been arduous and protracted, but the result is of a commensurate degree of importance; we venture to say that the well digested systems of England and Continental Europe were a very much longer time in the evolutionary process.

The names of the new officers of the Convention will be found in another column.

Trade Patriotism.

The Engineer improves the Woodstock and Bussey bridge disasters as follows:

"There appears to be no doubt whatever that the cause was a wretchedly bad steel rail, rolled in the United States from, it is said, a German bloom. It is, of course, a favorite boast with Americans that they can turn out more rails in a given time than English rail makers. In this case the more haste the less speed. United States steel rails are rapidly acquiring the reputation of being nearly as bad as the iron rails rolled in old times in Wales, which would break in two or three places if they were thrown out of a wagon.

"The lesson taught by these things is one that those may read who run. It is that unless railroads are designed by competent men, and are then made and worked honestly, the public will from time to time be slaughtered in heaps. Whether this circumstance is, or is not, taken into account by the great railway monopolists of the United States we cannot pretend to say. But we may and do say that such events should act as a warning to our own colonists and lead them to have as little as possible to say to American railroad engineers or their works. There are in the United States, beyond question, most talented, highly educated, and honorable engineers. It can hardly be said, however, that these gentlemen ever get a fair chance. They are pushed on one side by men less scrupulous, and colonists are more likely to have to deal with the last than with the first."

Noting that when we have a bridge accident we make it a principal to save enough passengers to tell the story and that, in general, our tin pan bridges are not built by our best engineers, it gives us great pleasure to agree with our esteemed contemporary as to the necessity for competent design, with honest construction and maintenance; and there is small doubt that both competence and honesty were lacking in the design of the Bussey bridge, as well as competence in its inspection and maintenance.

The *Railroad Gazette* has before now called the attention of those interested to the fact that some of our rail mills put too little work on their rails, with marked advantage to the quantity of their outputs, and if we did not make rails faster and with less labor than in England, we would probably be paying as much now for steel rails as we did pay for the Welsh rails. But the editor of *The Engineer* must have relied exclusively on his own imagination for the assertion that there is or has been any similarity between our steel rails and those Welsh bars for which we paid his countrymen so long a price in the days which are forever past.

The difficulty with American rails is not that they break, but that they will not break; instead of being treacherously brittle from the maximum amount of mill cinder that they could be made to carry, they have been too soft from a deficiency of carbon. Until lately 56 to 60 pounds has been the standard weight for rails in this country, while the weight of locomotives has about doubled, and the load of an eight-wheeled car has increased from ten to thirty tons. Under these circumstances, it has been necessary to keep our rails soft, with the result that we had only 45 accidents reported during the last year from broken rails. Poor's Manual returned for the 127,729 miles of railroad in this country 160,597 miles of track, of which 61,905 miles still had iron rails, or over twice the total mileage of all the roads in the United Kingdom. It is admitted that the returns do not show that these accidents were from Welsh rails.

The "warning to our own colonists" is undoubtedly necessary, and should be repeated frequently, for in spite of the efforts of *The Engineer*, there is a growing tendency in the English colonies to adopt the methods and machinery that have proved so economical and efficacious in the United States—methods and machinery which, according to Mr. Jeans, have enabled us, by increasing our working expenses a little over 4 millions sterling, to earn an additional 27¼ millions, while in the United Kingdom an increase of about 6 millions in net receipts has required an increase of over 10 millions in working expenses.

But the most remarkable clause in the sentences above quoted is the reference to "the great railway monopolists of the United States." Mr. Poor, in a report to "The English Association of American Bond and Shareholders," returns the amount of traffic and the rate received for it on twenty-one leading American roads, as follows:

	Tons. 1,000 = 1.	Ton-miles. 1,000 = 1.	Freight earnings. 1,000 = 1.	Rate per ton-mile. Cents.
1865	22,350	2,370,763	$69,825	2.945
1866	28,491	2,981,763	77,004	2.582
1867	30,840	3,222,824	75,381	2.338
1868	35,171	3,743,369	80,142	2 140
1869	39,835	4,408,321	87,426	1.983
1870	39 245	5,111,393	88.489	1.731
1871	50,256	5,937,679	97.187	1.636
1872	59.211	6,921 091	112 408	1.612
1873	67,384	7,885,702	127,046	1.611
1874	65.416	8,020,102	108.599	1.354
1875	63,921	8,380,102	107.058	1.284
1876	69,069	9,072,839	102,010	1.124
1877	73,556	9.131,613	100.804	1.103
1878	75,553	10,433,738	105.974	1.015
1879	96,336	13,033,723	114.255	0.876
1880	106,485	14.085,993	139.331	0.988
1881	126.750	16.074.694	146.700	0.912
1882	134.124	16.075.167	147 719	0.918
1883	142,655	17,307,649	167,564	0.968
1884	144,291	17,501,751	153,736	0.876
1885	150,972	18,837,730	144,562	0.767

On the other hand, Mr. Jeans says: "In the United Kingdom any reductions that have occurred in these directions during the same interval (1871 to 1884) have been immaterial." This agrees with the comparison of the English rates mentioned by Colburn and Holley in 1857 with those now current, and during 1885 the American freight rates were about one-third only of what Mr. Jeans asserts were the English rates of 1884.

In the light of the above data we are forced to the conclusion that the editor of *The Engineer* was writing hurriedly when he re-echoed the vulgar cry of our demagogues against "the great railway monopolists of the United States."

Provision Exports.

The report of the Bureau of Statistics shows that while the provisions exports in March were much less in value than the exports of the two previous months, they were nearly 10 per cent. greater than those of the same month of the previous year. While the March exports of pork products this year were 7,500,000 pounds less than last year there was an increase of $380,000 in the value of such exports over March of last year.

The value of the exports of beef, pork and dairy products in March and the three months ending with March, and of the beef and pork products (not including dairy products) exported during the five months ending with March, have been as follows, for the years named:

	March.	Jan. 1 to March 31.	Nov. 1 to March 31.
1887	$6,401,765	$21 906.983	$36 435.920
1886	5 826 645	19,136,777	31,661 164
1885	6,359,052	25 760.529	41,186.331
1884	5,610,905	21,657.582	38,421.000
1883	10.4 4,325	31,205,190	48,048,900
1882	7,993,329	30,440,290	48.103.255
1881	8 199,186	52,470.972	73,425.552

While the value of the March exports this year is greater than that of any other year since 1883, the aggregate for the five months is much less than that of any other year, with the exception of 1886. That year they were about 13 per cent. less than this year. For the three months since Jan. 1, this year's exports are not only greater than last year's, but are slightly in excess of those of 1884.

The larger proportion of the provision exports consists of pork products. From 1877 to 1881, there was a very large increase in the amount of pork exports, but in 1882 the exports decreased nearly one-half, as compared with those of the previous year. This was considered the natural consequence of the small corn crop of 1881, and it was supposed that with better crops there would be an increase in the pork exports. But this does not seem to have been the case. The corn corps of 1884 (1795 million bushels), and 1885 (1936 million bushels) do not appear to have been followed by any very great increase in the hog exports. As compared with the two previous years, the corn crop last year was a small one, being only 1650 million bushels; but the exports of hog products for the five months this year are larger in pounds than for the same period of any year since 1882, as will be seen from the following statement showing the exports of hog products, in millions of pounds, and their value for March and for the three months and for the five months ending with March of each year:

	—March.—		—Three months.—		—Five months.—	
	Million lbs.	Value.	Million lbs.	Value.	Million lbs.	Value.
1887	56.2	$4,482,366	217.1	$16,5+1,828	397.3	$29 417 296
1886	63.5	4,098,009	203.2	13,984,894	353 8	24.953.09?
1885	50.1	4.070.344	223.7	18.563,179	372.9	31,708,451
1884	32.7	3,403,145	143.6	14,209,990	298,4	28,?65,688
1883	65.3	7,163,643	218.1	23,441,972	359.4	38,517,936
1882	57.4	6 038 580	233.8	24,094,336	399.4	41.302.625
1881	130.0	5,993,383	414.6	41.834.724	742 5	63,643,456

For the four years previous to 1881, the exports of hog products for the five months ending with March were, in millions of pounds:

1877.	1878.	1879	1880.
385.9	540.5	615.2	541.8

While the number of pounds shipped during the five months this year is greater than that for the corresponding time in any year since 1882, and only about one-half of one per cent. less than the amount exported in that year, the value of the exports this year has been exceeded in every year, except 1884 and 1886. In 1884, when the quantity exported was 25 per cent. less than this year, the value was only 3.6 per cent. less, and in 1882, when the quantity was ⅓ per cent. more than this year, the value was 40.4 per cent. more. This of course, is the result of the great drop in the average price of all pork products in the last few years. The average price of hog products for the five months ending with March during the last seven years has been, in cents per pound:

1881.	1882.	1883.	1884.	1885.	1886.	1887.
8.57	10.34	10.99	9.51	8 48	7.05	7.40

As will be seen, from 1881 to 1883 there was a very material advance in the average price, which reached nearly 11 cents per pound in 1883. Since that time there has been a steady dropping in prices, until last year the average price was 18 per cent. less than in 1881. This year, however, the tendency has been upward, though the advance over last year's price is only .35 cent per pound, or a little less than 5 per cent. On the 397.3 million pounds exported, this amounted to nearly $1,400,000, which is no insignificant sum. If the average price which obtained in 1883 (10.99 cents) could have been secured on this year's exports, the difference between the actual value of this year's shipments and what would have been received in that event amounts to $14,263,000.

The quantities and value of the various kinds of pork products exported and the average price in cents per pound during the five months ending with March have been:

	—1887.—			—1886.—		
	Million pounds.	Value	Average price.	Million pounds.	Value.	Average price.
Bacon	183.6	$13,686,971	7.45	174.5	$12,433.258	7.12
Hams	27.9	2,955,344	10.59	21.6	1,987,882	9.21
Pork	34.2	2 157,163	6.31	35.5	2,084,484	5 87
Lard	151.6	10,617,818	7.01	122 3	8,453,602	6.91
Total	397 3	$29,417,296	7.40	353.9	$24,959,226	7.05

Thus there has been an increase this year over last in the quantities exported of all classes of hog products except pork, and an increase in value of exports of even that class. There has not been, however, a uniform advance in the average price of all classes of hog products. While the lard exports this year are nearly 30 million pounds greater than last year, there has been an advance of only one tenth of a cent per pound in price. The greatest advance in price has been in the ham exports, the average price of which was 1.38 cents per pound higher than last year.

While the exports of beef products are very much smaller than the exports of hog products, they are of considerable importance. For the five months ending with March the exports of beef products have been:

	—1887.—		—1886.—	
	Million pounds.	Value.	Million pounds.	Value.
Canned		$1,855,962		$1,215,800
Fresh	34.4	2,977.457	40.7	3,728,281
Salted and picked	10.7	953,244	16.3	1,030,243
Tallow	20.4	1,231,961	13 8	733,757
Total	77.5	$7,018,624	70.8	$6,708,071

The quantity of canned beef is not shown for the reason that there is no report of the number of pounds exported last year. For the five months of this year there were 23,017,084

pounds exported; and if there has been no very great change in price this is an increase of about 50 per cent. over last year's exports, as there has been that increase in the value of the exports of that article. While there has been an increase of 9.5 per cent. in quantity and 4.6 per cent. in value of the total beef products, there has been a decrease of 15 per cent. in quantity and 20 per cent. in value of the fresh beef exports. The exports of salted and pickled beef this year were 2.4 per cent. in quantity and 7.5 per cent. in value less than last year. The tallow exports were 91 per cent. in quantity and 68 per cent. in value greater than last year's exports. As can be seen at a glance, there has been a very considerable reduction in the average price of all classes of beef products exported this year as compared with the average price last year.

The value of the dairy products exported have been:

	1887.	1886.
March	$514,693	$463,655
Jan. 1 to March 31	8,856,773	9,580,644

While there has been an increase of 11 per cent. in March exports, the value of the exports for the three months this year is 8.2 per cent. less than for the same period in 1886.

New York Grain Receipts by Routes.

The flour and grain receipts at New York during March are shown in the following statement, which also shows how the receipts last month compare with the previous month:

	March. Bushels.	February. Bushels.	Inc. or Dec. Bushels.	P. c.
N. Y. Central	2,473,346	1,884,217	+ 589,129	31.3
Erie	1,770,420	1,310,346	+ 460,074	35.1
Pennsylvania	1,283,260	567,934	+ 715,326	126.0
Lackawanna	533,773	455,282	+ 78,491	17.1
West Shore	1,381,350	547,207	+ 834,143	152.4
Various	1,149,325	989,582	+ 159,743	16.1
Total rail	8,591,474	5,754,568	+ 2,836,906	49.3
Coastwise	55,732	105,732	— 50,000	47.3
Total	2,647,206	5,860,300	+ 2,786,906	47.6

Thus the total receipts last month were 47.6 per cent. greater than those of the previous month, and nearly 25 per cent. greater than the January receipts. As will be seen from the above statement, while the March receipts of every road were larger than its receipts in February, there was a very great variation in the per cent. of increase of the several roads. The largest increase both in actual quantities and in per cents. was in the West Shore receipts, but it must be taken into consideration that its February receipts were less than its receipts for any month since July, 1886. The Pennsylvania ranks second in regard to increase both in quantities and per cents. it obtaining in March a greater percentage of the total rail receipts than it has secured in any month since last August. While the receipts of the Lackawanna road last month were 17 per cent. greater than its February business, its percentage of the total rail receipts (a little over 6 per cent.) was smaller than an that of any month since August last. In March, 1886, the Lackawanna was evidently more actively interested in the grain movement, as it brought over 24 per cent. of the grain received at New York that month. The receipts by various routes (mainly Lehigh Valley) still continue large, having been 13 29 per cent. of the total last month. In February, however, the "various" receipts were over 17.2 per cent. of the total. The combined receipts of the New York Central and West Shore roads were 44.6 per cent. of the total receipts, as against 41.6 per cent. in February.

While the total receipts of flour and grain at New York were much greater than the receipts in either January or February, they were 15.7 per cent. smaller than those of March, 1886. For the last six years the March receipts have been, in bushels:

1882.	1883	1884.	1885.	1886.	1887.
5,063,330	10,226,564	6 278,880	12,290,022	10,256,150	8,647,206

Thus the receipts last month were smaller than those of the corresponding month of any of the above-named years, except 1882 and 1884.

The New York receipts of flour and grain for the three months ending with March have been as follows during the last two years:

	1887		1886		Inc. or Dec.	
Road.	Bushels.	P. c.	Bushels.	P. c.	Bushels.	In. p. c
N. Y. Central	6,515,498	30.4	9,079,310	39 8	−2,563,817	− 6.4
Erie	4,802,294	22.4	5,411,651	21.9	− 609,353	+ 0 5
Pennsylvania	2,393,109	11.2	3,089,632	12 5	− 697,523	− 1.3
Lackawana	1,615,444	7.5	4,239,607	17.2	−2,624,163	− 9.7
West Shore	2,887,302	13 5	1,630,416	6.6	+1,256,946	+ 6.9
Various	2,933,637	13.9	974,173	3.9	+2,009,761	+10.0
Total rail	21,196 643	9.89	24,430,789	98.9	−3,234,146	
Coastwise	237.256	1.1	272,114	1.1	− 34,858	
Total	21,433,899	100.0	24,702,903	100.0	−3,269,004	

The total receipts of flour and grain at New York for the three months ending with March this year were, therefore, more than three million bushels (or about 13 per cent.) less than the receipts in 1886. This probably is no more than could be expected when we consider the movement during the last six months of 1886, as compared with the corresponding period in 1885. For the six months ending with last December the receipts at New York by all routes, including the canal, were 78.4 million bushels. During the same period in 1885 the receipts only aggregated 69.2 million bushels. Thus the receipts for the six months of 1886 were 9.1 million bushels more than for the last half of 1885.

The New York Central and the West Shore together carried about the same proportion of the total receipts for the first quarter of this year as they carried of the receipts of the first three months of 1886; their combined percentage this year being 43.9, as against 43.4 last year. During the three months just ended the percentage of the New York Central proper was 6.4 per cent. less than its percentage in 1886, but this was a little more than offset by the increase in the West Shore's per cent., from 6.6 per cent. last year to 13.5 this year. The largest decrease in both actual quantities and per cents. seems to have been in the receipts of the Lackawanna. That road's receipts for the three months were 2.6 million bushels less than during the first quarter of 1886, and its percentage of the total receipts wes only 7.5 per cent. this year, while for the same time last year it carried 17.2 per cent. of the total receipts. This marked decrease is, probably, partly in consequence of its not having been so active in the market recently as it was a year ago, and partly the result of the introduction of a new competitor which has practically the same Western connections as the Lackawanna. The "various" receipts were about 2,000,000 bushels greater during the first quarter of this year than they were for the first quarter of 1885. From this it is only reasonable to assume that during the period under consideration the Lehigh Valley brought to New York about 10 or 11 per cent. of the total grain receipts. If so, its share of the total business was about a third larger than the Lackawanna's, and nearly the same as the Pennsylvania's. It must be remembered, however, that a very large proportion of the grain traffic of the Pennsylvania road goes to Philadelphia and Baltimore instead of coming to New York.

In order that a comparison may be made of the total receipts at New York for the last three months with the receipts during the corresponding periods of former years, we give the following, showing, *in millions of bushels*, the total flour and grain receipts at New York during the first three months of each of the years named.

1882.	1883.	1884.	1885.	1886.	1887
17.6	26 3	16.6	28 2	24.7	21.4

Flour and Grain Exports.

As there is no great fluctuation in the local consumption of breadstuffs at the East, any increase or decrease in the receipts at the seaboard must largely be the result of variation in the export demand. This, of course, may not always be the case, as owing to commercial influences affecting the prices in the markets, the increase or decrease of the quantities in store at the seaboard, etc., the seaboard receipts may fluctuate without there being any corresponding variation in the quantities exported.

For the first three months of this year and the same period of the four previous years the exports of flour and grain from the four principal Atlantic ports (New York, Boston, Philadelphia and Baltimore), have been, *in bushels:*

Month.	1887.	1884.	1885.	1886.	1887.
January	14,608 809	10,148,305	14,209,913	8,734,021	13,931,119
February	13,249.6 8	6,651,690	11,722,717	8,399.330	10,594,184
March	11.785,802	7.301,069	10,656,977	12,678,788	16,289,293
Total	39,644,269	24,101,064	36,679,607	29,812,139	40,814,596

Thus the exports during the first quarter of this year were larger than the exports during the same period of any of the other years named, being about 11 per cent. larger than those of the first quarter of 1885, though the seaboard receipts in January, February and March, 1885, were about 11 per cent greater than the receipts for the last three months. This was no doubt caused by the variations in the quantities in store at the Atlantic ports. It will be seen that while the exports in January and February this year were only about an average two months' business, the March business was exceptionally large, exceeding the March business of previous years, as follows: 28 per cent. more than in 1886, 53 per cent. more than in 1885, 123 per cent. more than in 1884, and 39 per cent more than in 1883. The exports from the four ports for the last six months of the year have been, *in millions of bushels:*

1882.	1883.	1884.	1885.	1886
71 6	61.2	64.9	49.7	64.5

The exports for the nine months ending with March have therefore been as follows, *in millions of bushels:*

1882–3.	1883–4.	1884–5.	1885–6	1886–7.
111.2	85.3	101.6	79.5	105.3

Thus the total exports for the 9 months ending with March this year have been larger than those of the corresponding period of either of the four preceding years, except 1882-3.

The flour and grain exports of the several ports for the first quarter of the year, during the last five years, have been as follows, in bushels:

Year.	New York.	Boston.	Philadelphia.	Baltimore.	Total.
1883	22,284,313	3,255,212	3,625 862	9,744,882	39.044,269
1884	14,192,781	3,695,017	1,711,592	4,498,674	24.101,064
1885	19,435.025	3,560,207	3,935,220	9,749,155	36,679,607
1886	15,560,031	3,690,434	1,719,540	8,842,134	29,812 139
1887	22,281.060	4,328,925	3,840,872	10,363,739	40,814,596

While the receipts at New York for the three months of this year were smaller than its receipts for the corresponding three months of either of the previous years (except 1884), its exports during that period were larger than they have been any year since 1883, when they were practically the same as this year. In fact, during the last three months the exports from New York were about 850,000 bushels more than the receipts at that port during the same time. Taking into consideration the local consumption, this must have resulted in a very large reduction of the stock in hand at that port on March 31, as compared with the amount in store on January 1. This excess of exports over receipts for three consecutive months is exceptional, for the last five years at least. This year is the only time when it has occurred at New York; though it is not so exceptional that the exports for *one* month should be larger than the receipts. In February, 1883, the exports from New York were nearly 3½ million bushels more than the receipts. By reference to the above statement, it will be seen that during the last five years in no instance were the exports for the three months from either of the other ports greater than the receipts at the same port during the same term.

The exports of the several ports during the three months were as follows, expressed in per cents of the totals of the four ports:

Year.	New York.	Boston.	Philadelphia.	Baltimore.	Total.
1883	56.2	10.0	9.1	24 7	100.0
1884	58.8	15.4	7.1	18.7	100.0
1885	53 0	9.7	10.7	26 6	100.0
1886	52.2	12.4	5 8	29 6	100.0
1887	54.6	10.6	9.4	25 4	100.0

While the actual quantity exported from New York this year was exceptionally large, it does not appear to have secured an unusual proportion of the traffic. Its percentage this year was 2.4 more than in 1886 and 1.6 more than in 1885. In 1884, its percentage was 4.2 greater than its this year's percentage, but the total exports were smaller that year than in either of the other years. In 1883, when the actual exports from New York during the first quarter of the year were practically the same as this year, its percentage was 1.6 greater than its percentage this year. The actual exports from Boston were larger this year than in either of the other years, but its percentage was 1.8 less than last year and 4.8 less than in 1884. Philadelphia exports were greater, actually and relatively, this year than in either of the other four years, except 1885. In that year its exports exceeded this year's exports by 95,000 bushels; its percentage being 10.7, as against 9.4 this year. The Baltimore exports in the last three months were larger than those of the first quarter of either of the other years; but its percentage of the total was 4.2 greater in 1886, and 1.2 greater in 1885, than its per centage this year.

Seaboard Receipts of Flour and Grain.

The receipts of flour and grain at the four Atlantic ports (New York, Boston, Philadelphia and Baltimore) during last month aggregated 20,916,683 bushels. This is an increase of nearly 52 per cent. over the receipts of the previous month; but the February business was a small one, as compared with the movement of the same month of the two preceding years.

For the last five years the grain receipts (including flour) at the four ports have been, in bushels:

Year.	New York.	Boston.	Philad'a.	Baltimore.	Total.
1883	10,318,478	3,561,638	2,136,471	3,280,267	19,316,854
1884	6,330 420	2,005,201	1,453,475	2,710,107	12,49 9,403
1885	12,290,022	2,585,841	2,588,700	3,807,219	21,271,782
1886	10,256,150	3,575,896	1,986.450	4,608,100	20,426,596
1887	8,647,206	3,571,793	3,577,213	5,120,471	20,916,683

It will be seen that while the total receipts last month have not been exceeded by the March receipts in any of the other years shown above, except in 1885, when the receipts were about 350,000 ousbels, or less than 2 per cent., greater than last month, the receipts at Philadelphia and Baltimore during the month were greater than for either of the four years 1883–1886; and as Boston seems to have held its own, the gains at the two southern ports appear to have been secured at the expense of New York.

A better understanding of the relative gains and losses of the several ports will be arrived at by an examination of the following statement, showing the percentages of the several ports of the total March receipts for the years named:

Year.	New York.	Boston.	Philadelphia.	Baltimore.	Total.
1883	53 4	18 5	11.1	17 0	100.0
1884	50.7	16 0	11.6	21.7	100.0
1885	57.8	12.1	12.2	17 9	100.0
1886	50.2	17.5	9.7	22.6	100.0
1887	41.3	17.1	17.1	24.5	100.0

Thus New York's percentage of the total receipts last month was very much less than its percentage of the March receipts of any other year of the five, being a loss of 8.9 per cent. as compared with its percentage in March, 1886. In March, 1885, its percentage was greater than during any of the other years, being 57.8 per cent., or 16.5 per cent. more than last month. Boston's percentages of the March receipts in 1883 and 1886 were larger than its percentage last month, but the actual March receipts of that port in each of the three years were practically the same.

The percentages of both Philadelphia and Baltimore were greater this year than their percentages of either of the other years.

The total flour and grain receipts of the four ports during the three months ending with March, during the last five years have been, in bushels:

Year.	New York.	Boston.	Phila.	Baltimore.	Total.
1883	24 264,247	8,448,507	5,999,729	10,239,823	48,952,206
1884	16,835,731	6,643,129	4,136,802	5,583,498	33,199,160
1885	28,185.214	6,811,477	6 861.964	11,561,199	53 419,854
1886	24,702,903	7.784,360	4,261,311	10,453,163	47,201.737
1887	21,433,890	8,323,893	7,274,411	11.760 348	48,792.551

The total receipts for the first quarter of this year make a very good showing, as they were not exceeded during the same period of any other year except 1885, when they were about 11 per cent. greater than this year. The difference between the receipts of the first quarter of 1883 and the three months of this year is so small (160,000 bushels) that the totals of both years may be considered alike. As the receipts of the four ports during the last six months of 1886 were as large as the receipts during the last six months of either of the three preceeding years, it would not have been surprising if there had been a falling off in the business during the last three months. While the total receipts this year were between 3 and 4 per cent. in excess of last year's receipts, the receipts at New York were over 3,000,000 bushels less than they were last year, while all of the other ports had an increased traffic.

Expressed in per cents. of the total receipts the receipts at the several ports during the first quarter of the years named were as follows:

Year.	New York.	Boston.	Philadelphia.	Baltimore.	Total.
1883	49.6	17.2	12.3	20.9	100.0
1884	50.7	20 0	12.5	16.8	100.0
1885	52.8	12.7	12 9	21.6	100.0
1886	52.3	16.5	9 0	22.2	100.0
1887	43 9	17.1	14 9	24.1	100.0

Thus, New York's percentage for the quarter was less this year than during any of the other years, being 8.4 per cent. less than last year, and 5.7 per cent. less than its percentage in 1883, in which year its percentage of the total receipts was smaller than during any year prior to the present one. The percentage of Boston this year is about the same as its percentage in 1883, and has only been exceeded once during the last five years. In 1884, its percentage was 20, as against 17.1 this year, but its actual receipts were 1½ million bushels less than they were last month.

The percentages and actual receipts of Philadelphia and Baltimore for the last three months were greater than they were during the same period of either of the four years previous. The combined percentages of New York and Boston compare with the combined percentages of the two southern ports as follows, during the first quarter of the years named:

	1883.	1884.	1885.	1886.	1887.
N. Y. and Boston.....	66.8	70.7	65.5	6 .8	61.0
Phila. and Baltimore....	33.2	29 3	34.5	31.2	39 0

The attentive reader will have noticed in the "Notes in the South," by Mr. S. Wright Dunning, in last week's *Railroad Gazette*, a discussion of the effect of the Inter-state Commerce law on the Louisville, New Orleans & Texas Railway. This road is so situated as to present on its line sections where the competition with the river steamboats must be very close and direct, and other sections where there is no such competition. The conclusion reached in the "Notes" is that if the long and short haul clause is enforced, the road must give up most of its through freight traffic and try to live on its local traffic, with the result that the public will be the losers, and only the steamboats will gain by the enforcement of the law. Saturday last Mr. Cummins, General Counsel for the company, appeared before the Inter-state Commission in support of a petition for relief already filed. The differences of rates heretofore made by this road are often cited as showing the need of legislation. This case well shows the truth of the saying attributed to Commissioner Pierson, that "the great public will never know and even railroad men are surprised to find how many concessions to public requirement have been made in the effort of the railroads to accommodate the business on which they depend for revenue."

Serious results from apparently insignificant, almost contemptible, causes are constantly thrusting themselves upon the attention of railroad men, and it is interesting to see in how many cases there are two or more simple preventives, either one of which would have alone obviated the untoward consequences. The following case, which is not all romance, but which actually occurred the other night, in all but its worst features, will point our meaning: A passenger brakeman on approaching a station did not announce the name of it. Perhaps he knew that there were no passengers to get off at that time. Perhaps there was some other reason; at all events, he held his peace. But, however derelict he had been on this point, he evidently resolved to be *au fait* on the next piece in the programme; and so, in making the announcement that "the next stop is Hades Cross Roads," which should be given just *after* starting, he evinced an unusually prompt disposition by shouting out the words just *before* the train began to move; immediately shutting the door and going forward into another car. Now, there was in the car, near the door, a young woman who wished to get out at H. C. R., but who was unacquainted with the road and locality. She, in less time than it takes to tell it, arose, opened the door, went out and alighted on the wrong side—that is, on the adjoining main track—in the dark, there being no gate or barrier to prevent her, and no bright light or other noticeable device to attract her to the right side. The brakeman had gone forward and of course did not see her movements. The impatient engineman of the express train on the other main track, seeing that the accommodation train was ready to start, had put on steam before it really started, and as the woman stumbled and fell, of course ran over her; and furnished a concluding chapter, which in some papers would be announced for the succeeding issue, but which we, imitating certain metropolitan dailies, insert here, whether it really occurred or not. The brakeman made a mistake of only a few seconds' time in his announcement, and it can be plausibly claimed that no ordinary discipline will provide against such infinitesimal errors; but the use of gates on the cars would provide against one important danger at least. The running of express trains past way stations where local passenger trains are stopping is a serious and constant danger on the larger roads, even where the speed is greatly slackened, and all possible safeguards should be employed to mitigate the evil.

A correspondent asks "how hot and how dangerous do crown sheets and flues become when an engine goes down a a very steep incline, such as a coal trestle?"

It is impossible to give a general answer to this question. Crown sheets do undoubtedly often become momentarily uncovered by the surge of the water when the brake is suddenly and forcibly applied in switching, but no harm appears to result from this, if there is plenty of water in the boiler. The return wave will then soon again cover the sheet.

It is of course best to err on the safe side and keep enough water in the boiler. If there be any excess of carbon in the sheets, a slight amount of overheating will result in a crack when the boiler is cold, and a sheet that is covered with a non-conducting incrustation is soon overheated. It is obvious, too, that a green fire will not overheat an exposed sheet as quickly as a hot fire, and therefore this alone would prevent any definite rule on the subject beyond the safe one of keeping the water level well in sight. The practice of running with low water in order to secure dry steam is, however, practiced by a few men, and if great care and watchfulness are exercised, the results may often be satisfactory, as the following anecdote will show:

An old engineer of our acquaintance, Mr. Alexander Kier now foreman of a large round-house, was very apt to cut things rather fine; and in the old days of pumps would often arrive at a station with the water barely level with his crown sheet. In order to guard against any mischief while the train was standing for any time, taking water, etc., he would put his tender brake hard on and then open his throttle gently so as to lift the water a bit, and so cover his crown sheet. He was esteemed the best runner on the road. He had once to convey a high and mighty magnate. He broke down on one side midway in the journey. He promptly disconnected, hung two fire-bars on his safety valve lever, and proceeded with one side, getting in on time, and looking as blandly innocent as a cat who has discovered the cream pitcher. The H. & M. M. never discovered that aught was amiss.

On another occasion Zerah Colburn was taking some indicator diagrams on his engine. Mr. Alick Kier let her have it for all she was worth and belted round some badly laid curves and over rotten wooden trestles at a pace that made Colburn's hair feel like standing. When the journey was over Zerah Colburn came back to the foot plate and said in a solemn and awe-struck tone:

"Do you know what pace you have been running?"

"Oh, an honest 50," replied Mr. Kier, with his pleasant smile.

"Sixty-six miles an hour," replied Zerah Colburn, very solemnly and impressively.

Mr. Colburn afterwards told the writer that this was the greatest speed he had ever taken, and as he had a great deal of experience in the matter and was a very accurate observer, there can be little doubt that 66 miles per hour was an unusual speed twenty years ago.

The city of Bangor, Me., has finally officially adopted Eastern standard time, after a protracted controversy. All cities of importance in the Eastern section now use standard time, though there are several in the vicinity of the dividing line between the Eastern and Central divisions which still deem it necessary to remain out of joint with the world in general.

Railroad Comissioner Cappeller, of Ohio, has issued a circular to the railroads of the state, calling attention to their neglect to report to his office all casualties and accidents as required by law (section 257). The statute prescribing no form in which the reports shall be made, the roads have very generally ignored it.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines in 1887 is given in the current number of the *Railroad Gazette* as follows:

Chicago & Northwestern, from Salem, Dak., 12 miles.

Fort Worth & Denver City, since last reported, 10 miles.

Piedmont & Cumberland, between Piedmont, W. Va., and Cumberland, Md., since Jan. 1, 16 miles.

Wisconsin Central, on the Gogebic branch in Wisconsin, 27 miles.

This is a total of 65 miles for the week, making 859 miles reported thus far for the current year. The new track reported to the corresponding date for 16 years has been:

Miles.	Miles.	Miles.	Miles.
1887.....859	1883.....973	1879.....391	1875.....208
1886.....509	1882.....1,876	1878.....367	1874.....347
1885.....209	1881.....966	1877.....269	1873.....598
1884.....543	1880.....1,096	1876.....399	1872.....932

This statement covers *main track only*, second or other additional tracks and sidings not being counted.

NEW PUBLICATIONS.

The Transactions of the American Society of Civil Engineers for January, 1887, contains a description of the 600-ton testing machine at the works of the Union Bridge Co., at Athens, Pa., and a discussion on testing machines.

THE SCRAP HEAP.

"Hey, Rube."

John Robinson, the millionaire circus owner, says about the Inter-state law that "No class of people is hurt by it like show people, and most of all circus people. Here is my show, for instance, with contracts made with railroads for the coming season months before the framing of the law. The law coolly cancels them and establishes rates that demand about everything from the circus proprietor but the marrow in his bones. We use our own cars—I own upward of forty—we do our own loading and unloading, and still no discrimination in our favor is to be made, 3 cents a mile each for 200 people traveling in their own cars."

Another Presidential Candidate.

The habit of pronouncing a man's name as you meet and shake hands with him has some obvious advantages, which this result of the failure to do so will illustrate. It is a true story. A Watertown, N. Y., manufacturer, recently met H. M. Britton, Superintendent of the Rome, Watertown & Ogdensburg road, and mistaking him for Chauncey Depew, began:

"Do you think Blaine has any chance next year?"

"None at all."

"Now, why don't you take it yourself? If you get the nomination you can be elected over any man in this country."

Mr. Britton replied, with his accustomed modesty.

"Now, what's the matter with your building a branch to Watertown and taking the business away from the R., W. & O.? You shall have every pound of my freight, and all my neighbors'. They have got the meanest—"

Mr. Britton introduced himself.

Change in Copartnership.

Joseph G. Cupples, of the publishing firm of Cupples, Upham & Co., Boston, having disposed of his interest in the business to Charles L. Damrell and Henry M. Upham, the firm will be continued under the style of Damrell & Upham at the "Old Corner Bookstore," Boston.

For the Improvement of Railroad Directors.

At a conference of the Railway Mission, held recently in Edinburgh, Lord Polwarth explained that the object of this mission is the welfare, in every sense, of those who are engaged on British railways, and to make each of them a Christian gentleman. He said that the British public needs to realize more and more to what a very great extent they are indebted to all the railway servants, from the humblest porter to the highest director. It will be interesting to watch the results of this mission. An organization that undertakes to get for railroad directors a little more kindness and consideration from the public, and above all, to make them Christian gentlemen, deserves encouragement. Our own Congress seems to have tackled the railroad problem at the wrong end after all. Lord Polwarth has the right idea.

A Transformation.

At this time Sault Ste. Marie, Mich., is only reached by sixty-five miles of hard staging from St. Ignace, but within the year five railroads will enter there. The Canadian Pacific will close a gap of eighty miles from the east; the Minneapolis, Sault Ste. Marie & Atlantic has contracts let for 230 miles to complete a nearly direct line from Minneapolis; a road projected from Duluth to the Sault will build so as to close a gap between the latter point and Ontonagon; the Michigan Central will build from St. Ignace, and the Grand Rapids & Indiana (controlled by the Pennsylvania Central), will also build in from its present northern terminus.

Consolidated Railway Telegraph Co.

The Phelps Induction Telegraph Co. and the Railway Telegraph & Telephone Co. have consolidated under the above title at No. 13 Park Row, New York, and own the patents of Smith, Gilliland, Edison and Phelps. The new company assumes existing contracts with the Lehigh Valley, the New York, New Haven & Hartford and other roads. The officers are: President, Chas. A. Cheever; Vice-President, Chas. E. Crowell; Secretary and Treasurer, Henry D. Hall; Electrician and Superintendent, Lucius J. Phelps, with Thos. A. Edison as Consulting Electrician.

Hasn't Time to be a Railroad President.

P. D. Armour was asked this evening if he could state who would be the probable successor of Alexander Mitchell as President of the Chicago, Milwaukee & St. Paul Railroad. Mr. Armour answered "no," and to a suggestion that he himself might be the man, replied emphatically that he would not accept. The law requires the President to be a resident of Wisconsin, a condition with which Mr. Armour would not comply. "Neither would I," said he, "allow myself to take a position which would entitle every holder of a hundred shares of St. Paul stock to be running into my office inquiring why I did not do this, or why I did not do that.—*New York Tribune.*

Alexander Mitchell.

Mr. Mitchell was a man of the highest moral and physical courage. When his bank in Milwaukee was assaulted by rioters at one time and all the doors and windows were barricaded, he came out bareheaded on the porch in the upper story, and shaking his fist at the crowd shouted, "come on."

He was a philanthropic man and his charities amounted to many thousands of dollars a year. He had numerous dependents whom he supported as pensioners and no needy and deserving person was ever turned away empty handed. But he had an inveterate hatred for impostors. He loved good horses, old friends and social observances.

Fine Philosophy and Facetious Blasphemy.

"No, sir," he said emphatically, "I have traveled for 40 years on the road, and I never yet went through an accident." "How do you account for it?" "Well, sometimes I think it's Providence and sometimes I think it's because I never happened to get on a train that was wrecked."—*Tid-Bits.*

Play this very Softly.

Tambo—"Do you know why am de Inter-state Commus law like a piece of tuneful music?"

Interlocutor—"No, I do not. Why is the Inter-state Commerce law like a piece of tuneful music?"

Tambo—"Because it am a mal odious measure."

(Tumultuous omelet from the pit.)—*Binghamton Republican.*

TECHNICAL.

Locomotive Building.

The Old Colony has ordered from the Taunton Locomotive Works two heavy switching engines, and has begun to build at its South Boston shops two freight engines with 54 in. steel boilers and 18 × 24 in. cylinders.

The Car Shops.

Twenty-five car builders at the United States Rolling Stock Works in Urbana, O., struck for better pay last week. They demanded $20 per car against $15 now received. They claim that it takes 4 men 22½ hours to make a car and that by the hardest work, and they only receive $15 for it.

The Indianapolis Car Works have completed an order for 300 box cars for the Cincinnati Hamilton & Dayton road and have received the contract for building 250 cars for the same road.

Bridge Notes.

Van Wagner & Degaun, of Syracuse, N. Y., have a contract for building 7 four-track bridges for the New York Central & Hudson River Company.

Manufacturing and Business.

Gould & Eberhardt, of Newark, N. J., are getting out an entirely new automatic rack cutter, capable of cutting racks only. With the exception of one or two very expensive and cumbrous machines, there has been no machine built thus far for this purpose. In this machine the work is done with perfect accuracy, at the same time requiring the operator's time only in setting the work and starting the machine.

The patent suit brought a number of years ago by Messrs. Hicks & Smith against the Chicago, Milwaukee & St. Paul Railroad, the Dayton Manufacturing Co. *et. al.*, for alleged infringement of the Hicks & Smith patents on car lamps, has been dismissed, a settlement of the controversy having been satisfactorily agreed upon and a license given the Dayton Co. to use the Hicks & Smith patents.

Edward Kendall, Geo. F. Kendall, James H. Kendall have formed a co-partnership under the firm style of Edward Kendall & Sons, to continue the business heretofore carried on by the late firm of Kendall & Roberts, of Cambridgeport, Mass., manufacturers of hoisting machines.

The Ingersoll Rock Drill Co. report recent sales, as follows:

Shepard, Winston & Co., for the "Galena" 2,500 ft. tunnel on Chicago, Burlington & Northern R. R., 12 drills and plant.

Prize Mining Co., Central City, Col., 2 drills and plant.

Mary Murphy Mining Co., Colorado, 7 drills and plant.

Lady Murphy Mining Co., Colorada, 3 drills and plant. To Bessemer, Mich., 14 drills and plant. The March sales were greater than in any preceding month since the company was organized, and the April business to date exceeds that of March.

Larson, Keefe & Co., for "Wickes" 6,100 ft. tunnel, Montana, 16 drills and plant.

Iron and Steel.

The Carbon Iron Company, with its principal office in New York City, has just completed the purchase, for $250,000, of a plot of ground in Pittsburgh, where the works of the company are to be erected.

Charles Tippie has contracted to erect the buildings for the works of the Ivens & Sons Machinery Company at Decatur, Ala.

The Albany Iron Works, near Albany, N. Y., which cost a million dollars, were sold at auction Tuesday, for $125,000, to J. Howard King and Dudley Olcott. The property in the town of Bethlehem is assessed $130,000. There is also a lease for 999 years of an ore bed in Berkshire Co., Mass. The island property comprises two blast furnaces, a large manufacturing building, engines, locomotives, trestles, etc., 25 acres of land, and some land under water.

A new 100-ton furnace called the "W. B. Wood Furnace Co.," has been organized at Florence, Ala., and $150,000 stock taken.

At the meeting of the directors of the De Bardeleben Coal and Iron Co., held April 8, at Bessemer, Ala., it was decided to erect immediately at Bessemer another furnace plant in addition to the one now nearly completed. The plant will consist of two 17 × 75-ft. blast furnaces, seven Whitwell stoves and 300 coke ovens, making 600 coke ovens in all. The company has also purchased 50,000 acres of additional land, consisting of more than twenty miles of the celebrated red and brown ores in Murfrees Valley. This makes 100,000 acres of valuable mineral lands owned by this corporation.

The Rail Market.

Steel Rails.—Very little business reported by Eastern mills. There are rumors of heavy sales of English rails, figures going as high as 45,000 tons for Pacific Coast delivery, the Atchison, Topeka & Santa Fe Company being the reported purchasers. The company has denied this. The cable reports a sale of 10,000 tons, San Francisco delivery. In this market there are inquiries for late summer and early fall deliveries, and in the West some business is doing. Among the transactions is a lot of 10,000 tons for a leading Western road; another lot for a Southwestern road of about 12,000 tons, of which 7,000 tons went to one mill and another 5,000 ton lot to a Pennsylvania works. We quote nominally, $39@$40 at Eastern mill.

Old Rails.—No business has been done. For shipment we quote: T's, $22@$22.50; and double-heads, $22.50@$22.75.

Scrap.—Market is very quiet, with yard scrap at $23@$23.50, and foreign, for shipment, at $21.25@$21.50, with little offering.

Rail Fastenings.—Spikes, 2.50@2.70c., delivered; angle fish bars, 2.20@2.25c.; steel angle bars, 2.25c.; bolts and nuts, 3.15@3.20c., and bolts and hexagon nuts, 3.30@3.40c.

The Boston Tunnel.

The West End Railway Co., of Boston, was granted a hearing last week by the Legislative Committee on Railways. A bill was presented providing for the rights to issue stock to the amount of $12,500,000, the right to tunnel under Boston Common, under Beacon Hill, or both, and also giving the company the right to absort any and all street roads doing business in Boston. The Boston *Herald* prints a map of the city showing the routes planned by the company. Beginning at the Park street church, one line goes under Park street, one under the Common to Park square in front of the Boston & Providence station and one across to Spruce street on Beacon. From a point underneath Beacon street at the head of Park, five lines radiate,—namely the Park street (already spoken of); a second to Park square; a third running north cutting under many streets diagonally until it reaches the corner of Charles and Cambridge streets; a fourth following the general line of Mt. Vernon, Temple, Staniford and Prospect streets, coming out near the Lowell depot, and a fifth going down Beacon to Tremont and School streets. The surface is very hilly and uneven, and the depth of the proposed tunnels underground varies from 3 to 60 ft. The bill provides that the company may operate cars by electric motor or cable, with the consent of the aldermen or selectmen.

Heating Cars by Steam.

A passenger train heated by steam from the engine has commenced running on the Northern Pacific, between Brainerd and Duluth. The coaches are heated by two radiators at each end of the car, and by pipes inclosed in metal boxes running through the cars, the heat being controlled by registers. The steam is supplied direct from the locomotive boiler, but with extra long trains or in very cold weather the plan contemplates the use of a special boiler on an iron car. The result of this experiment on a line which runs through such a cold region will be awaited with much interest.

The New Palace Train.

The vestibuled train of five Pullman cars made its first trip this week over the Pennsylvania road between Chicago and New York. It is made up of 3 sleepers, a dining-room car and a combination library and baggage car. It is one of three trains that are to run regularly.

The Armor and Gun Steel Contract Awarded.

Secretary Whitney has awarded to the Bethlehem Iron Works the contract for furnishing about 1,400 tons of steel gun forgings and 4,500 tons of steel armor plates at a total cost of $4,512,938. In his order making the award Secretary Whitney gives his reasons for selecting the Bethlehem Co. as follows:

"Concerning the bids for armor and gun steel I have concluded, after full consideration, that the Bethlehem Iron Co. is entitled to the award of the contracts for both. To encourage bidding, a clause was inserted in the advertisement that 'bids covering both' (that is, armor and gun steel) 'will receive preference, other things being equal.' The bid of the Bethlehem Iron Co. for the gun steel refers to their bid for the armor handed in at the same date and has the following memorandum: 'The prices named in this proposal are based upon the conditions stated in the advertisement of Aug. 21, 1886, that "bids covering both" (gun forgings and armor plates) "will receive preference, other things being equal," and are, therefore, to be considered in conjunction with our bid of this date for gun forgings.' A similar memorandum is contained in their bid for armor plates. The Bethlehem Iron Co. is the only bidder for the whole contract. The theory of the advertisement was that the government wanted the lowest price for the whole work (paying more or less for one or the other being immaterial, so long as the entire job is obtained at the lowest total price), the total sum for the whole job being the material thing. With this view the advertisement was framed so as to obtain the largest range of bidding, allowing a person to bid for either or for both; but the total sum which the whole should cost the government being the matter alone to be considered. The two lowest separate bids for the two classes being that of the Cambria Iron Co. for the gun steel, and the Cleveland Rolling Mill Co. for the armor plate, amounts to $4,873,073.90. That of the Bethlehem Iron Co. for the same classes amounts to $4,512,938.29. They are the lowest bidders for the work by the sum of $360,135.61. Since the bidding has taken place the Bethlehem Co. has offered to reduce its prices on the the gun steel, so as to make that company the lowest bidder for each of the separate classes. This may be done under the circumstances, although I should not permit it if I did not consider them, on other grounds, entitled to the award."

Mineral Lands to be Leased.

The Detroit, Mackinac & Marquette Railroad Co. has recently opened up for option and lease its mineral lands in Marquette and Iron counties, Mich., about 200,000 acres scattered through the two counties. They have been opened to option and lease at a royalty on ores of 25 cents for non-Bessemer and 50 cents for Bessemer. All the applications for options are made to and considered by W. O. Strong, the land commissioner of the company, at his office in Detroit.

Locomotive Building.—A Correction.

The Rhode Island Locomotive Works are not building a fast passenger engine for the Boston & Maine, as reported in a recent issue of the *Gazette*. The engines now running the fast express trains between Boston & Portland were built by the Mason Machine Works, Taunton, Mass., and are stated to give great satisfaction. A somewhat similar engine by these builders is illustrated and described in "Recent Locomotives."

Two Months' Imports of Iron and Steel.

The following, according to the official returns, were the imports of iron and steel during the months of January and February.

Imports of Iron and Steel for Two Months.

Articles.	Gross tons. 1887.	1886.
Iron ore	228,880	141,346
Pig iron	48,830	47,365
Scrap iron	40,202	6,773
Scrap steel	2,710	939
Bar iron	4,359	3,067
Steel rails	20,517	.....
Cotton ties	.....	240
Hoop, band and scroll iron	.....	92
Steel hoops, bands and plates	3,117	327
Ingots, blooms, billets and slabs	54,106	11,606
Sheet plate and taggers iron	771	619
Tin plates	39,169	35,452
Wire rods	22,010	20,220
Wire and wire rope	487	711
Anvils, axles and forgings	341	93
Chains	111	76

The above figures show that in the majority of important lines the imports this year continue as heavy as they were last year. In iron ore, old rails; steel rails and billets, slabs and blooms there is a heavy increase. Probably the most interesting figure is that regarding the heavier quantities of steel plates imported. For some time foreign material of this kind has had a chance, and it has been vigorously pushed.—*Iron Age.*

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Atchison, Topeka & Santa Fe, annual meeting, Topeka, Kan., May 5.

Central, of New Jersey, annual meeting, at the office, Jersey City, N. J., May 6.

Chicago, Burlington & Quincy, annual meeting, at Chicago, May 18.

Delaware & Hudson Canal Co., annual meeting, at the office, New York, May 10.

Denver & Rio Grande, annual meeting, at the office, Denver, Col., May 2.

Elmira & Lake Ontario, annual meeting, at the office, New York, May 5.

Lake Shore & Michigan Southern, annual meeting, at the office, Cleveland, O., May 4.

Michigan Central, annual meeting, at the office, Detroit, Mich., May 4.

Missouri Pacific, special meeting, at St. Louis, Mo., May 10.

New York, Chicago & St. Louis, annual meeting, at the office, Cleveland, O., May 4.

New York, Susquehanna & Western, annual meeting, Jersey City, N. J., May 5.

Norfolk & Western, annual meeting at the office, Roanoke, Va., May 4.

St. Louis & San Francisco, annual meeting, at St. Louis, Mo., May 11.

Vicksburg & Meridian, annual meeting, at the office, New York, May 2.

Harrisburg & New England, annual meeting, at the office, May 2.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Baltimore & Ohio, 4 per cent., on stock of Main Stem, payable May 17.

Baltimore & Ohio, 5 per cent., on stock of Washington Branch, payable April 20.

Boston & Providence, $4 per share, payable May 2.

Cincinnati, Hamilton & Dayton, 2 per cent., quarterly, payable May 1.

Concord, 5 per cent., semi-annual, payable May 2.

Tennessee Coal, Iron & Railroad, 1 per cent., payable May 15, to stockholders of record May 1.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Master Car-Builders' Club* holds its regular meetings at the rooms, No. 113 Liberty street, New York, on the third Thursday in each month.

The *New England Railroad Club* holds its regular meetings at its rooms in the Boston & Albany passenger station in Boston, on the second Wednesday of each month.

The *Western Railway Club* holds its regular meetings at its rooms in Chicago on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

American Society of Civil Engineers.

At the regular meeting held April 20, the discussion of Mr. Metcalf's paper on steel was finished.

Mr. Secretary John Bogart announced that the summer convention will be held at Hotel Kaaterskill, probably the first week in July. The trip up the river will be made by boat, with a stop at the Poughkeepsie bridge.

Engineers' Club of Philadelphia.

A regular meeting was held April 2, 1887.

The Secretary presented, for Mr. Theo. Low, Notes on Railroad Construction. The paper treats of detail in the management of surveys and plans, forms of note books, methods of accurate measures for bridge work, coffer-dams, etc. It embodies many excellent suggestions as to practical details.

Mr. Francis Lightfoot exhibited and described a stamp splice, tongue and groove rail joint, devised by him. The ends of the rails are stamped, at the heat at which they leave the last roll, into such shape that they will halve over or against each other, and sustain each other by an arrangement of tongues and grooves. They are simply bolted together without any additional plate or fixture. They have been laid on a portion of the Pennsylvania Railroad, where they are being subjected to severe test. The inventor claims that the test to date has been entirely successful, and that many advantages have been obtained over other forms of joint.

Mr. Max Livingstone presented a paper on Petroleum. Discussing the question of petroleum as fuel, it is shown that even with the burners as now in use, which are far from perfect, it would, under many conditions, be found economical to substitute oil for coal. In conclusion, our strongest competitor, the Russian oil, receives attention: "Large as the production of oil in the United States is, it is eclipsed by the enormous production of Russia, which would make competition on our part in some of the most important markets of the world impossible, were it not mainly for two reasons, to wit: the superior quality of our oil, and the powerful, sagacious and economical management here. The Russian oil has a much heavier specific gravity than ours, and produces but little naphtha, while our oil yields from 10 to 12 per cent. of this desirable material. Russian refiners obtain only 30 per cent. of illuminating oil; we produce upward of 75 per cent. Last, but not least, the residuum from our crude oil is rich in paraffine wax, whereas the Russian oil produces none."

PERSONAL.

—Robert E. Pattison has been elected Chairman of the Pacific Railroad Commission.

—Reuben Wells, formerly Superintendent of Machinery for the Louisville & Nashville Railroad Co., has resigned to accept a position with the Rogers Locomotive Works.

—F. M. Fonda, who was recently elected Superintendent of the Central Railroad of Georgia, was accidentally shot and killed by J. J. Abrams, while making a trip down the Savannah River on April 17.

—Captain John Grant died in New Orleans, La., on April 5. He was a railroad contractor and built the first railroad in Louisiana, the Ponchartrain. He was a native of Pennsylvania, and was 92 years old at the time of his death.

—Henry Ilmer, said to be the oldest locomotive engineer in the United States, died at Whistler, Ala., on April 15. He ran the first engine over the Charleston & Hamburg, the third railroad built in this country. The driving wheels of this engine were hard wood.

—It is reported that Andrew Carnegie, of Pittsburgh, the best known of all American steel manufacturers, is to be married this week to a Miss Whitfield, of New York. After the wedding Mr. Carnegie and his wife will sail for Europe on the North German Lloyd steamer Fulda.

—John Lord Hayes, LL. D., died at his home in Cambridge, Mass., on April 18. Mr. Hayes organized and was Secretary of the Mexican, Rio Grande & Pacific Railroad Co., and in 1854 obtained a charter from the Mexican Government, which authorized the construction of a railroad across Mexico.

—Henry A. Breed, an old and respected citizen of Lynn, Mass., has just died at the age of 90. Mr. Breed supervised the construction of the City of Brunswick, Ga. He built the canal from Altahama to Turtle River and a railroad from Brunswick to Tallahassee, more than 200 miles. Mr. Breed was one of the founders of the Massachusetts Horticultural Society.

—Edward A. Moseley, who was chosen Secretary of the Inter-state Commerce Commission this week, was born in Newburyport, Mass., in 1846. When a boy he shipped before the mast in a voyage to Calcutta. He came home and was engaged in the East India trade for several years. For the past 10 years he has been a member of the lumber firm of Stetson, Moseley & Co., of Boston. Mr. Moseley has been a representative in the Massachusetts Legislature for two years. He is also a member at large of the Democratic State Committee and a member of the Executive Committee.

—C. H. Crosby, who has just been elected Vice-President and General Manager of the United States Express Company was from 1870 to 1873 in the General Freight Department of the Evansville & Crawfordville Railroad; from 1873 to 1880 he was General Freight Agent of the St. Louis & Southeastern; in 1880 and 1881 he was Assistant to Commissioner Albert Fink; in 1881, 1882 and 1883 he organized and managed the Erie & New England Express, of which George R. Blanchard was the President; from 1883 till his late election Mr. Crosby has been Assistant to the President of the U. S. Express Company.

—James Robertson Thompson, senior member of the Jersey City Steel Co., died at his home in New York on April 18. Mr. Thompson was born at Broadalbin, N. Y., nearly 65 years ago. When he was 24 years old he established the steel works in Jersey City, with which he has since been identified. He was a member of the Union League Club of New York, and was the founder of the Adirondack Club, and its President. He was an enthusiastic sportsman, and went regularly to the Adirondacks in the spring and fall for fishing and shooting in the large preserve set apart for the use of the Adirondack Club. He was a man highly esteemed by many friends.

—Alexander Mitchell, President of the Chicago, Milwaukee & St. Paul Railroad Co., died in New York at the Hoffman House, on April 19. The immediate cause of the death was bronchial pneumonia. Mr. Mitchell was a native of Scotland, being born in Aberdeenshire in 1817. He started to study law, but gave it up to enter the banking business. He came to America in 1839 and took a position in the Wisconsin Marine and Fire Insurance Bank, of Milwaukee. He ascended through the various grades of office in this bank until he was chosen its president, and controlled the majority of the capital stock of the institution. He was its president up to two years ago, and made it one of the most powerful banks in the West. It was as a banker and investor in real estate that Mr. Mitchell acquired his large fortune. He became a director in the Milwaukee & Waukesha road in 1848. In 1864 he was elected President of the Chicago, Milwaukee & St. Paul Railroad Co., which had been formed by a combination of various independent Wisconsin lines. Mr. Mitchell's other railroad experience included service in the Northern Pacific for several years, and a brief time when he was President of the Chicago & Northwestern, filling the unexpired term of Henry Keep. For several years Mr. Mitchell was President of the American Bankers' Association. He was elected to the House of Representatives in Congress in 1870 on the Democratic ticket, and was re-elected in 1872, serving on the Committee on Banking and Currency. This comprised his public career. Mr. Mitchell was one of the founders of the Milwaukee Club in that city, and was also a member of the Union League, Union and Manhattan Clubs of New York.

ELECTIONS AND APPOINTMENTS.

Albemarle & Pantego.—The company was organized at Norfolk, Va., last week, by the election of the following officers: John L. Roper, President; Walter H. Taylor, Vice-President; John F. Stewart, Secretary and Treasurer; John L. Roper, W. H. Taylor, Wm. H. White, W. D. Pruden, of North Carolina, and Wilson Godfrey, of New York, Directors.

Almaden Branch.—The directors are: E. J. Coleman

Charles E. Stewart, W. W. Gaskill, E. T. Pillsbury, L. Fillmore.

American National Transportation Co.—The incorporators of this new Chicago company are: James J. Hoch, W. J. Methven and Lainie Higgs.

American Rapid Transit Construction.—The directors of this new California company are: H. G. Rollins, T. R. Bennington and J. K. Mulkey, of Los Angeles; D. Gilbert Dexter, of San Diego; A. E. Clark and J. H. Brant, of St. Paul, Minn.

Boston Equipment Co.—At a meeting in Canton, O., last week the following directors were unanimously elected: W. J. Rotch, W. O. Chapman, Eben T. Blood, E. J. Blandin and George E. Baldwin.

Buffalo, New York & Philadelphia.—W. J. Davis succeeds H. J. Bookhammer as Master Mechanic.

Central Pacific.—The directors and officers of the Central Pacific and Southern Pacific, and all their branch lines, were re elected in San Francisco last week.

Central Transportation Co.—At the annual meeting in Philadelphia this week the following officers were elected: President, M. Richard Muckle; Secretary and Treasurer, John A. Stauffer; Directors, John S. Stevens, B. P. Opdyke, Evan Morris, William H. Lucas, George K. Reed, Francis F. Milne, Matthew Brooks, William O'Hara, and Joseph D. Wilson.

Chicago, Kansas & Nebraska.—W. I. Allen has been appointed General Superintendent, with headquarters at Horton, Kan. W. J. Tyler has been appointed Fuel and Car Agent, with headquarters at Topeka, Kan.; C. T. Newton, Superintendent of roadways, bridges and buildings, with headquarters at Topeka.

Chicago Railroad Association.—The Passenger Department held its annual meeting, and the following officers were elected: President, W. E. Davis, Chicago & Grand Trunk; Vice-President, William Hill, Chicago & Eastern Illinois; Secretary, Sam. Wilson, Chicago & Northwestern. The old executive committee was re-elected.

Chicago, Santa Fe & California.—Charles S. Sweet has been elected Secretary of this company.

Cincinnati, Jackson & Mackinaw.—H. R. Johnston has been appointed Traffic Manager.

Cincinnati, Lebanon & Northern.—The directory of this road reorganized last week by the re-election of the old officers.

Cincinnati, Wabash & Michigan.—The following have been elected directors: J. H. Wade, H. B. Payne, William Bingham, R. E. Mix, F. W. Pelton, W. S. James, John Newell, C. P. Leland, George H. Stayner, Henry S. Ives, N. Beckley. The officers are: J. H. Wade, President; William Bingham, Vice-President; W. S. Jones, Secretary and Treasurer; Norman Beckley, General Manager.

Cincinnati, Washington & Baltimore.—At the annual meeting in Cincinnati last week the following directors were elected: Orland Smith, James D. Lehmer, W. W. Peabody, J. L. Keck and Judson Harmon, of Cincinnati; W. T. McClintic, of Chillicothe; Robert Garrett, of Baltimore; E. R. Bacon, of New York; Fred. Boughton, of Chicago. The board subsequently organized by electing Orland Smith, President; E. R. Bacon, Vice-President; Chas. F. Low, Secretary and Auditor; Wm. E. Jones, Treasurer. Col. Smith, Robert Garrett and Frederick Boughton were appointed the executive committee.

Cleveland & Dayton.—At a meeting in Dayton, Ohio, last week, John H. Ferguson was elected President; Henry W. Horner, Cleveland, O., Secretary and Treasurer. The following directors were elected: W. C. Gardenhire and V. C. Allen, of Rhea; W. S. Hunter, of Meigs; Capt. J. W. Smith, of James, and C. T. Campbell, P. B. Mayfield, J. H. Gaut and J. L. Young, of Bradley County, O.

Columbus, Lima & Northwestern.—At the annual meeting in Lima, O., this week the following officers were elected: President, B. C. Faurot, of Lima; Vice-President, A. O. Bailey, of Lima; Secretary, F. B. Graff, of Defiance; Treasurer, Frank Langan, of Lima.

Denison, Bonham & New Orleans.—S. G. Eddy has been elected General Superintendent of Construction.

Denver & Rio Grande.—David H. Moffatt, of Denver, Col., has been elected President in place of W. S. Jackson, resigned.

Denver, Texas & Fort Worth.—The officers of the new company are: Sidney Dillon, of New York, President; John Evans, of Denver, Vice-President, and John T. Granger, Secretary and Treasurer. The directors are: Sidney Dillon, F. K. Pain, James Stillman and S. Tilgman, of New York City; Henry Lewis, of Philadelphia; John Evans, of Denver, and A. T. Walters, of Baltimore.

East Carolina Land & Railway Co.—At a meeting in New Berne, N. C., this week, the following officers were elected: President, C. E. Foy; Vice-President, Dr. E. W. Ward, of Onslow; Treasurer, Dr. J. F. Long; Secretary, James Redmond.

East Tennessee, Virginia & Georgia.—E. B. Thomas has been appointed General Manager.

Elgin, Joliet & Eastern Indiana.—The directors of this new Indiana company are: Charles S. Holt, Norman Williams, Arthur T. Towne, John L. Thompson, Russell Whitman, Arthur J. Caton and Arthur D. Wheeler.

General Time Convention.—The officers for the ensuing year are as follows: President, H. S. Haines (Savannah, Florida & Western); First Vice-President, J. M. Toucey (New York Central & Hudson River); Second Vice-President, D. J. Chase (Atchison, Topeka & Santa Fe); Secretary, W. F. Allen (*Official Guide*); Executive Committee, J. T. Harahan (Louisville & Nashville); H. B. Stone (Chicago, Burlington & Quincy); James McCrea (Pennsylvania Co.); T. M. R. Talcott (Mobile & Ohio); E. B. Thomas (Richmond & Danville); A. H. Swanson (Houston & Texas Central).

Grand Tower & Carbondale.—J. D. Peters has been appointed Superintendent of this company and also of the Grand Tower Department of the St. Louis Ore and Steel Co.

Hannibal & St. Joseph.—D. H. Winton has been appointed Assistant Superintendent in place of A. B. Barnard. Headquarters at Kansas City, Mo.

Indianapolis & St. Louis.—T. M. Shumaker has been appointed Contracting Agent, with office at St. Louis, Mo.

Inter-state Commerce Commission.—Edward A. Moseley has been chosen for Secretary of the Commission.

Kanawha & Richmond.—The following have been elected officers: Wm. S. Edwards, Charleston, W. Va., President; Emmons Blaine, Chicago, Vice-President; E. C. Pechin, Cleveland, Second Vice-President; Malcolm Jackson, Charleston, Secretary.

Kansas City Association of Railway Superintendents.—J. O. Brinkerhoff, of the Union Pacific, has been elected President, vice L. W. Towne, resigned.

Kansas City, St. Joseph & Council Bluffs.—Samuel P. Jefferies has been appointed Train Master, vice D. H. Winton, promoted.

Lake Erie & Western.—H. D. Parker has been appointed General Traffic Manager, with headquarters at Bloomington, Ill.

Louisville & Nashville.—R. S. Miner has been appointed Superintendent of the South & North Alabama Division, vice L. Hege, who has been assigned to other duties.

Marquette, Houghton & Ontonagon.—Andrew Watson has been appointed General Manager and Superintendent in place of John Hornby, resigned. Mr. Watson is also Superintendent of the Detroit, Mackinac & Marquette.

Missouri Pacific.—John C. Jennings has been appointed General Freight Agent, with headquarters at Sedalia, Mo.

Mobile & Ohio.—J. E. Capps has been appointed Master Car-Builder, with headquarters at Whistler, Ala. J. H. Dougherty has been appointed Acting Master Mechanic.

New York Central & Hudson River.—At the annual meeting in Albany this week, the old boards of directors of this and the West Shore companies were re-elected.

Northern Maine.—The following were chosen directors at the meeting in Bangor, Me., last week: Llewelyn Powers, of Houlton; George H. Freeman, James W. Bolton, and Joseph B. Hall, of Presque Isle; Henry C. Sharp, of Monticello; George P. Wescott, of Portland; and O. F. Crockett, of Rockland, Me.

Northern Pacific.—J. W. Kendrick, in addition to his duties as Chief Engineer of the St. Paul & Northern Pacific, has assumed the duties of Consulting Engineer for the Maintenance of Way Department, Eastern Division, Northern Pacific. Headquarters at St. Paul.

Ohio Southern.—At the annual meeting in Springfield, O., this week the following directors were elected: Austin Corbin, Alfred Sully, J. R. Maxwell, R. K. Dow, of New York; Dumont Clark, G. H. Frey, F. L. Chapman, William N. Whitely, Springfield; H. L. Weakly, Troy, Ohio; Isaac Brown, Jackson, Ohio; H. S. Wellard, Wellston.

Paris, Marshall & Northwestern.—John Martin has been elected President in place of E. Zeile, resigned.

Pittsburgh & Lake Erie.—J. B. Gaches has been appointed Trainmaster.

Toledo & Ohio Central.—Paul Prager has been appointed Southern Passenger Agent, with headquarters at Middleport, O.

United States Express.—C. H. Crosby has been elected Vice-President and General Manager of this company, with headquarters at Chicago, Ill.

Valley.—At the meeting in Cleveland, O., this week, H. B. Payne, L. V. Boohins and L. C. Higgins were elected directors for 3 years.

OLD AND NEW ROADS.

Albemarle & Pantego.—Organized at Norfolk, Va. The road will connect the Pungo and Pamlico River and sound, thence by ferry to Edenton, where connection is made with the Norfolk Southern road. Six miles of the line are already built. The road is of standard guage with steel rails.

Almaden Branch.—Incorporated in California to build a 14 mile road from a point on the South Pacific Coast road known as Campbell's Station in Santa Clara County, eastward to a point in Santa Clara County at the easterly end of the right of way obtained from the Quicksilver Mining Co., by James G. Fair. Capital stock, $500,000, of which $499,500 has been subscribed by James G. Fair.

American National Transportation Co.—This company has been incorporated in Chicago, Ill., for the construction and operation of refrigerator cars and cold storage houses. Capital stock, $500,000.

American Rapid Transit Construction.—Incorporated in Los Angeles County, Cal., for the purpose of contracting for the construction of electric railroads, known as the Enos Elevated Electric Railways. Capital stock, $500,000.

Arkansas Valley.—Contracts for the construction of 100 miles of the Kansas extension of this road have been awarded to McCarthy & Co., of Little Rock, Ark., and to Mr. Cameron.

Atchison, Topeka & Santa Fe.—The San Francisco *Chronicle* says that it is reported in California railroad circles that this company has made a contract with an English firm for 45,000 tons of steel rails, the cost of which will be about $1,000,000. The contract, it is said, stipulates that they are to be delivered in San Francisco by 12 ships chartered for the purpose. Western officials of the road, the *Chronicle* further states, profess ignorance of the contract and the purpose for which the rails are secured, but others who are in a position to know assert that the surveys of a line from Mojave, the present Western terminus of the Atchison to North Beach, within the limits of San Francisco have been made. The distance is 400 miles, and the amount of rails ordered under the reported contract would be just about the quantity needed for the proposed line. The story further says that the new road will run from Barstow south to Los Angeles, *via* Colton, and after traversing San Buenaventura County, will enter Santa Barbara County either by the Casitas pass or by the beach from the town of Ventura by way of Rincon and Carpenteria to Santa Barbara. The route from Santa Barbara to San Luis is a plain one, as the Atlantic & Pacific has already secured the right of way through the Gaviota pass to the valley of the Santa Maria. From San Luis the grade is easy. The road can be run into the valley of the Salinas, and, avoiding the errors of the Southern Pacific, the line will keep the west side of the valley and tap a large section of farming country which has been seeking a market by sea for years.

Atchison, Topeka & Santa Fe.—It is reported that the company will build an industrial town 11 miles west of Kansas City, Mo., on the model of Pullman, with shops, churches, etc.

Atlanta & Hawkinsville.—This company invites bids for earth excavation, earth borrow, loose rock, solid rock, second-class masonry, third-class masonry, box culverts, terra cotta drain pipe, 12 in. and 18 in. in diameter, trestling per 1,000 ft., iron in trestling per pound, average haul over 500 feet, rock haul per mile, hard pan, clearing and grubbing per acre, tracklaying and surfacing per mile, for new road, from a point 33 miles from Atlanta, on the route surveyed to Fort Valley, Ga. Bids will be received for not less than five miles, and for the entire line of about 70 miles. Work to be commenced within thirty days from signing of contract, and to be completed by Jan. 1, 1888. Address bids to H. L. Collier, Chief Engineer, 42½ East Alabama street, Atlanta, Ga. Bids received until May 4.

Baltimore & Ohio.—It is announced that the bulk of the options given for the proposed bid deal will expire on April 25 by limitation. Some of the options, given at a later day, do not expire till next month.

Bessemer & Huntsville.—The contract for grading this road in Alabama has been let to J. F. B. Jackson. The line has been located to Murphree's Valley, Blount County, Ala., and work has been commenced.

Boston, Concord & Montreal.—The directors have served a notice upon the Boston & Lowell officials requiring them to surrender all property held under the lease of the Boston, Concord & Montreal to the Boston & Lowell, which lease they deem void since the decision of the Court in the case of Dow *vs.* the Northern Railroad, annulling the lease of that road to the Boston & Lowell. Should the surrender not be made, proceedings in equity will be instituted for the annulment of the lease.

Boston & Maine.—Arrangements are being made for a new fast train, to leave Bar Harbor, Me., at 5 a. m., arriving in Boston at 3:45 p. m., so that passengers may catch the 4:30 p. m. train on the Boston & Albany to New York, arriving there at 10:30.

Brunswick & Western.—A syndicate composed of Indianapolis and Cleveland men is negotiating for the purchase of this road which runs from Brunswick to Albany, Ga., a distance of 170 miles.

Buffalo, Rochester & Pittsburgh.—The company is now receiving a large lot of new 70-lb. steel rails. Enough new oak ties have already been received to lay over 40 miles of track.

Canada Atlantic.—Arrangements are being made for building an extension of this road from La Colle, Quebec, to Alburgh Springs, Vt. Only twelve miles of track are required to complete the link which gives direct communication between Ottawa and the New England system. The estimated cost is $150,000.

Central, of Georgia.—It is reported that this company has determided to lease or purchase certain valuable cotton compresses in Savannah, Ga. These are the Lamar, the Tyler and the United Hydraulic presses. The first named is private property. The Tyler press is capitalized at $130,000, and the United Hydraulic at $250,000.

Central of New Jersey.—It is reported that this road is now controlled by three parties, Austin Corbin and his friends owning one-third, the First National Bank party holding another and the Lehigh Valley Co., representing the Pennsylvania, owning the remaining interest.

Chesapeake & Ohio Canal.—The directors have decided to reduce the tolls on coal from Cumberland, Md., to Georgetown and Washington from 40 to 36 cents. On coal east-bound or coastwise the toll is reduced from 38 to 34 cents. It was decided in the meeting last week to pay the coupons on the bonded debt of the canal on July 1. The idea was generally expressed that unless the canal can be made to pay it will have to be sold.

Chicago, Milwaukee & St. Paul.—Tracklaying was completed last week between Chillicothe, Mo., and Ottumwa, Ia., 121 miles, on the Kansas City extension of this road. Ninety per cent. of the grading of the 89 miles between Chillicothe and Kansas City, Mo., is finished, and tracklaying will begin at once. Regular trains will be running by July 1.

Chicago & Northwestern.—A despatch from Mitchell, Dak., states that this company has about 125 men at work laying track between Mitchell and Salem, and that track is laid about 12 miles out from the latter place.

The extension of this road from Iron Mountain to Watersmeet, Mich., will be finished July 1.

Cleveland, Akron & Columbus.—The contract for the graduation, masonry, tunnel work, timber work, tracklaying and ballasting of the Dresden branch of this road has been awarded to Paige, Carey & Co., of Akron, O.

Cleveland & Canton.—The Boston Equipment Co. held its annual meeting in Canton, O., last week. About $400,000 worth of the stock of the Equipment Co. is held by the opposing factions of the Cleveland & Canton Railroad Co. Just before this meeting the attorney of the Corbin faction applied to the Court for an injunction to restrain the Blood party from voting their stock. The Judge fixed the date of the hearing for April 23, and ordered that no election be held till then. The meeting was held, nevertheless, the Corbin people refraining from voting.

Denver, Texas & Fort Worth.—This company is reported to have filed articles of incorporation in Colorado. The objects are to build a road to connect with the Denver, Texas & Gulf road at Pueblo, Col., and continue to a connection with the Fort Worth & Denver City, which is now completed 200 miles north of Fort Worth, and also for the construction of a road south from Fort Worth to the Gulf of Mexico, the same to be operated as an independent line from Denver to the Gulf. A number of branch lines are to be built in Southern Colorado and New Mexico. The capital stock is named at $30,000,000.

Duluth, South Shore & Atlantic.—The appointment of Andrew Watson as general manager of the Marquette, Houghton & Ontonagon, places the latter road and the Detroit, Mackinaw & Marquette under one management, practically consolidating them as part of the Duluth, South Shore & Atlantic.

Elgin, Joliet & Eastern Indiana.—Articles of incorporation filed in Indiana. The proposed road is from La Porte through Porter and Lake counties to the Illinois line in Cook County, there to connect with another line to Elgin, Ill. Length of line, 50 miles. Capital stock is $1,000,000.

Elmira, Cortland & Northern.—The Erie Express Co. will withdraw its business from this road on May 1.

Fort Worth & Denver City.—Notice is given of a special meeting of stockholders in Fort Wort, Tex., on June 22. The business to be transacted in a proposition to add $20,000,000 to the capital stock of the company and to take steps to operate the Denver, Texas & Fort Worth and the Fort Worth & Denver as one road. Lands have been bought for shops and station adjoining the property of the road in Fort Worth. If the increase of the stock is voted the capital stock will be $30,000,000.

The track is now laid 35 miles beyond Quanah, Tex., and the grading is completed 60 miles further.

Galveston, Sabine & St. Louis.—Orders have been given for the extension of this road from its terminus, 22 miles south of Longview, Tex., onward toward the Gulf of Mexico. Large forces of men are at work preparing to change the gauge to standard. The company has ordered

$8,000 worth of car trucks for the change. A corps of engineers goes into the field this week. Contracts for ties, piling and timber have been let. The citizens along the line have a monster barbecue planned for May 2, and in the evening of that day there will be a grand ball; this in celebration of the happy fact that another strip of Texas land has rails laid upon it.

Grouse Creek.—This company has been incorporated in Kansas to build a standard gauge road from some point on the Denver, Memphis & Atlantic to Arkansas City, 28 miles. Capital stock, $600,000.

Hiawassee.—Charter is secured in Tennessee. The company intends to build a road from Chattanooga, Tenn., to the North Carolina state line.

Illinois Central.—The controversy between this company and the owners of its leased lines between Dubuque and Sioux City, Ia., has been ended by the purchase of these lines by the Illinois Central. A meeting of the shareholders of the Illinois Central which has just been called for June 12, to consider a proposition to increase the capital stock of the company by $10,000,000, is for the purpose of providing means for the acquisition of 48,000 shares of stock of the Iowa Falls & Sioux City Co. at $50 per share—$2,300,000—and of 50,000 shares of the stock of the Dubuque & Sioux City Co. at $80 per share—$4,000,000. The remaining $3,700,000 is to be applied to the completion of the Chicago, Madison & Northern from Chicago to Freeport, and thence to Madison, Wis., and to other work which the Illinois Central has now on hand.

Kanawha & Richmond.—Organized at Charleston, W. Va. The road is to be built from Charleston southward, connecting with the Richmond & Alleghany, Norfolk & Western and Richmond & Danville system.

Kankakee, Mendota & Western.—This company has been incorporated in Illinois. The object is to build a road from Kankakee, Ill., along the north bank of the Kankakee River, through Wilmington, Morris and other points to Marseilles, thence to Mendota and west to some point on the Mississippi River, and from Kankakee east to some point on the Indiana state line.

Lake Erie & Western.—The Purchasing Committee has filed a mortgage which is a first lien on the line from Sandusky, O., to Peoria, Ill., 430 miles. The mortgage is for $10,000 per mile, to draw interest at 5 per cent.

Lincoln & Black Hills.—Hundreds of men and teams are reported at work upon this road north of the Platte River in Nebraska. Several important construction contracts are now being let.

Little Rock & Alexandria.—Articles of incorporation filed in Arkansas. The proposed road is to run from Little Rock to a point on the state line between Louisiana and Arkansas, to Wilmington on the Onachita River, through Louisiana to Alexandria on the Red River, a distance of 220 miles. Capital stock, $2,500,000.

Marshall, Paris & Northwestern.—This road has been sold to the St. Louis & San Francisco, and the mortgage of $62,000 lifted by the cash payment of $23,000.

Memphis & Charleston.—In 1832 a charter was obtained for 46 miles of road between Decatur and Tuscumbia, Ala. The Memphis & Charleston owned the right of way, but this lapsed in 1882. A suit has just been decided against the company in favor of the owners of the right of way. The case will go to the U. S. Supreme Court.

Metropolitan Transit.—A great many protests against an elevated railroad along Broadway, New York City, were received by the Senate Railroad Committee at Albany this week. The hotel proprietors were heard from, and a great many of the heaviest Broadway property owners sent in documents in which the bill was strongly opposed. The Committee went into executive session on April 19, and decided to report the bill adversely.

The adverse report of the Railroad Committee was brought in to the Senate on April 20.

Milwaukee & Northern.—The work of building the extension from Iron Mountain to Republic, Mich., is being rapidly pushed to completion. It is stated that passenger trains will be running between Republic and Milwaukee, Wis., on Aug. 10

Moorhead & Southeastern.—Arrangements have been completed and the capital subscribed for building the line between Moorhead and Breckenridge, Minn., 45 miles. Work is to begin immediately.

New Roads.—The survey of the new road from the east end of the Poughkeepsie Bridge to Jackson Corners, N. Y., connecting with the Hartford & Connecticut Western, is finished, and arrangements are in progress for letting the contract for construction. The road will be 28 miles long, and it is expected it will be finished by Jan. 1, 1888.

It is reported from Milwaukee, Wis., that a syndicate has bought 400 acres of land at Grand Marais, where a town will be built, and that the contract has been let in St. Paul, Minn., for the building of a road from Grand Marais to connect with the Canadian Pacific, work to begin by July 1.

The Dummy Railroad Co., of Nashville, Tenn., which is building a line from Nashville in a southwesterly direction for 6 or 7 miles, has its road graded for some distance, and is awaiting the granting of right of way from the City Council.

The Manufacturers' Railway Co., of St. Louis, Mo., will construct a standard gauge road 2 miles in length in the city of St. Louis.

A survey was made last week for a road from a point on the Silver Springs, Ocala & Gulf Railroad above the head of Blue Spring, Fla., to Parkersburgh, Marion County, 4 miles

New York, Central & Hudson River.—The company has given contracts for 7 four-track bridges near Newark, N. Y., to Van Wagner & Degaun, Syracuse, N. Y.

New York, Chicago & St. Louis.—H. B. Hollins, of New York, has entered suit in Ohio against W. K. Vanderbilt and the above company to subject certain lands in Cuyahoga, Lorain and Lake counties, which are listed in Vanderbilt's name, to the payment of a mortgage of $250,000 held by Hollins. The land in question was bought for right of way, but was not used for that purpose.

New York City & Westchester.—This company has been incorporated at Albany, and proposes to build a road from Rye, in Westchester County, to the Harlem River with a branch to Neptune Island, Long Island Sound, 22 miles.

New York, Lake Erie & Western.—The Court of Appeals rendered a decision this week in the case of William Herring, of London, Eng., who, in 1881, claiming to be the owner of some Western Extension Trust bonds which were guaranteed by the old Erie Co., brought suit against the present company alleging that there were irregularities in the foreclosure proceedings which were completed in 1878. The company won the case at the time in the Special Term Court, but the plaintiff appealed to the General Term Court where the decision of the lower court was sustained, and then the case was carried to the Court of Appeals; and a favorable decision from this court definitely upholds the rights of the reorganized New York, Lake Erie & Western Co.

This company figured in another law suit this week. It was in the case in which it united with the creditors of McHenry in issuing attachments against his goods and effects in New York. McHenry's counsel made a motion to vacate these attachments. The Court refused to permit this, and the attachments still stand.

New York & Massachusetts.—Orders have been given for $150,000 worth of new steel rails for this road, which is to connect with the Poughkeepsie Bridge and to be extended eastward into Massachusetts. New cars have been ordered.

New York & New England.—J. A. Sperry, President of the New Haven & Derby, spoke before the New Haven Finance Committee this week, and asserted emphatically that the New York & New England is determined to get an entrance into New Haven, and that the ultimate object is to consolidate with the New York, New Haven & Hartford. He says that, no matter whether the Derby road is sold or not, the New England will build a connection with New Haven. Mr. Sperry further says that large stockholders in the New York, New Haven & Hartford have recently bought a large block of New England stock. Vice-President Reed, of the New York, New Haven & Hartford, said that he believed Mr. Sperry was mistaken in asserting that the New England people were about to force a consolidation with the New York, New Haven & Hartford.

New York, New Haven & Hartford.—A change is being contemplated which, if carried into effect, will result in the removal of some of the company's general offices from New York to New Haven. The Auditor, Treasurer, and General Ticket Agent are the officers who will change their beadquarters. If the change is made, a large addition will be built to the Union Station in New Haven.

The Railroad Committee of the Connecticut Legislature has reported in reply to the memorial of Henry L. Goodwin. The report says:

"The allegations relate to the sinking fund. Its income for the year appears in the Railroad Commissioners' report. The memorialist argues that it should appear in another part of the returns as part of the income for the year. The question is purely one of book-keeping. The method pursued by the company has been acceptable to the Railroad Commissioners and has been accepted by preceding General Assemblies.

"In regard to the purchase of the Northampton Company's stock the report says: 'The 12,298 shares of New Haven & Northampton Company's stock was valued by the committee when it was put into the fund at $737,880, being, as was supposed, about its market value. It stood at this valuation until last year, when, as the value of the stock had materially shrunk in the market, the committee reduced its valuation to $297,385 86, being a valuation of about $25 a share. This change in the valuation appears in the company's returns. The difference in their two valuations, $440,484.14, is the amount which the sinking fund has received from incomes and profits from changes in investments since it was begun in 1881.'"

Mr. Goodwin will protest against the reception of the report.

Work on the new depot and elevated tracks to do away with the Asylum street grade crossing in Hartford, Conn., was begun on April 18.

New York, Rutland & Montreal.—The road is to be sold by decree of the Court on June 2.

Northern Maine.—This company which was chartered by the last Maine Legislature organized last week. The road is to run from some point of the Maine Central to Houlton or Presque Isle. Steps are to be taken at once for a survey.

Ohio & Mississippi.—Two weeks ago an investigation was instituted by the Legislative Committee on Railroads in Illinois into the status of this company as relates to its compliance with certain constitutional and statutory regulations. The Committee finds that the company has not complied with the constitution, which requires a railroad to maintain a business office in the state; that it has not reported annually to the Commissioners, and that it has not a majority of directors in the state. The Committee recommends that the Attorney-General and the Railroad Commissioners be instructed to proceed by mandamus against the road to make it comply with the law and suffer the penalties under it, and that the state attorneys of the several counties call the attention of the grand juries to these facts, and have them proceed to collect the penalties.

Ottawa & Thousand Island.—A bill is before the Ontario Legislature for the incorporation of a company to be known by this name. It provides for the construction of a line of road from Ottawa through Carleton, Greenville and Leeds to a point on the line of the Brockville, Westport & Sault Ste. Marie road, or to some other point in the County of Leeds.

Pennsylvania.—The company has given notice that hereafter Cumberland coal can be shipped to all points of Philadelphia and the surrounding country at the same rates as Clearfield coal. The coal will be brought from the Cumberland region over the Huntingdon & Broad Top road, and will place an additional tonnage of 500,000 tons upon that road.

Pennsylvania, Slatington & New England.—John H. Fort, of Camden, N. J., has filed a bill in chancery against this company for the purpose of setting aside the consolidated mortgage under which the road was sold on April 20. It is alleged in the bill filed that the consolidation of the road with the Delaware & Slatington Railroad of Pennsylvania was accomplished by an illegal issue of stock and, therefore, the execution of the mortgage was unlawful. Application has also been made for writs of *quo warranto* to annul the charters of both companies.

The road was sold for $50,000 to W. W. Gibbs, of Philadelphia, who, it is said, represents the Standard Oil Company in this purchase.

Philadelphia & Reading.—The security holders have been assessed as follows: The income mortgage bonds, convertible adjustment scrip, debenture, guarantee scrip, and the first series of 5 per cent. income mortgage bonds, are assessed $100 for $1,000 of bonds or scrip, for which will be given second preference income mortgage bonds. The second series of 5 per cent. consolidated mortgage bonds pays $150 per $1,900 bond, and for the assessments are returned 50 per cent. of second preference income mortgage bonds and 50 per cent. of third preference income mortgage bonds; for convertible bonds of the railroad company and for the debenture bonds of the railroad company and of the coal and iron company respectively, the total assessments are 15 per cent. paid for in third preference income mortgage bonds; the preferred stock is assessed $10 per share, for which 55 per cent. in the third preference bond is paid; the common stock is assessed $10 per share and certificates of interest in the voting trust are to be given; deferred income bonds will be stamped as assenting to the plan and returned to the depositors— the assessment is $25 per $1,000 bonds.

Piedmont & Cumberland.—This road, which is from Piedmont, W. Va., to Cumberland, Md., is completed, with the exception of the two miles over the Cookerly farm, near Cumberland. There is a legal fight in progress over the right of way across this property.

Rock Island, Dodge City & Denver.—Incorporated in Kansas to construct a road from Arkansas City through the counties of Cowley, Sumner, Harper, Barber, Kiowa, Ford, Hodgeman, Garfield, Finney, Scott, Wichita and Greeley. Capital stock, $2,500,000. Principal office, Dodge City, Kan.

Rome & Carrollton.—It is not yet decided whether this road is to run to Carrollton, Ga., from Rome. It may go to Tallapoosa or Bowdon. The engineers are now at work near Tallapoosa.

St. Joseph & Grand Island.—The company has let the first contract for its Denver line, which is to start west from its main line at Fairfield, Neb. The contract is for 85 miles, between Fairfield and Alma. Work will be commenced at once.

St. Louis & Chicago.—This company has filed a mortgage for $4,500,000. The road runs from Litchfield, Ill., to Peoria, connecting with the Chicago & St. Louis at Peoria, and with the Indianapolis & St. Louis at Litchfield, giving over these roads a short line between St. Louis & Chicago. The line is an extension of one already built, and completes the gap between Peoria and Litchfield. It was projected by F. C. Hollins, Stevenson Burke and others. The mortgage just filed with the American Loan & Trust Co., is a consolidated 6 per cent., providing for the bonds already out on the old line, and to be a first lien on the new portion now building at about $20,000 per mile. The road is to be opened this summer. The company has a permanent traffic contract with the Cleveland, Columbus, Cincinnati & Indianapolis, which controls the Indianapolis & St. Louis.

This road is to be extended from Litchfield, Ill., to Mount Olive, 8 miles southwestward. The company has bought coal mines at that place and the main object in building the road is to compete with the Wabash in handling coal north and east.

The company has filed articles at Peoria, Ill., increasing its capital stock from $2,000,000 to $7,000,000, and also a deed of trust to the American Loan & Trust Co. The road is to connect Litchfield, Springfield, Joliet and Peoria, Ill.

St. Louis, Fort Scott & Wichita.—J. H. Richards, Receiver, has been informed by the Court at Wichita, Kan., that this road will be sold on May 23.

St. Louis & San Francisco.—On application of Walter Delmar, of E. L. Oppenheimer & Co., of New York, the Court has issued an order calling on the officers of this road to show cause, on April 25, why a peremptory writ of mandamus should not be issued compelling them to exhibit the transfer-books and a list of stockholders.

Argument on the order was heard on April 20. The petitioners claimed that the firm of Oppenheimer & Co. were holders of 20,000 shares and had a right to see the books and list of stockholders. Unless that right was conceded them the present officers might, behind this subterfuge of lack of jurisdiction, retain their power and possession of the management of the affairs of the company forever. The demand had been made against the transfer clerk to come within the law. Several decisions were cited.

John D. Burrill opposed the motion on the ground that the St. Louis & San Francisco was a foreign corporation within the meaning of the law, and that the Court had no jurisdiction in special proceedings. If the Court had no jurisdiction over a foreign corporation it had none over any officer thereof, as that would be virtually over the corporation. Judge Donahue reserved his decision.

Shenango & Allegheny Valley.—This road was sold at Receiver's sale on April 19 in Shenango, Mercer County, Pa. The road runs from Greenville through the Mercer coal fields to the Allegheny Valley. It was bid in by Thomas Fowler, the Receiver, in the interest of the stockholders, for $625,000.

Southern Pacific.—It is stated that the transfer of the Oregon & California to the above named company will take place on May 1. Sisson, Crocker & Co., the contractors, have 4,000 men at work on the line and expect to complete the road to a connection with the Southern Pacific within six months.

The road is now located into Santa Barbara, Cal. At this place it is said there will be built a large and expensive hotel, which will eclipse the lately burned Del Monte.

Tallahassee & Thomasville.—Work has just been begun on this road from Tallahassee, Fla., by the Savannah, Florida & Western engineers.

Terre Haute & Peoria.—The stockholders have voted to issue first mortgage bonds to the amount of $1,800,000, the money to be used in improving the road.

Toledo, Ann Arbor & North Michigan.—This company has made an offer to the Flint & Pere Marquette company for a purchase of 14 miles of its Harrison Branch line.

Union Pacific.—The Chicago *Times* prints "a well-defined rumor" to the effect that stockholders of this company are preparing to surrender the old Union Pacific Main Line for the Government debt, and to abandon their Omaha & Council Bluffs termini, making the several branches of the Union Pacific owned independently of the Government line a new system, with Lincoln, Neb., for a terminus.

This company is to build a branch from David City to Columbus, Neb., 20 miles, connecting the southern with the northern divisions of the road.

Wichita Falls & Winfield.—A depot and machine shops are to be built at Wichita Falls, Tex.

Wisconsin Central.—Tracklaying is now completed within 8 miles of Hurley, Wis., on the extension of this road from Mellen Junction to the Gogebic range.

TRAFFIC AND EARNINGS.

Inter-state Matters.

Inquiries made by *Bradstreet's* as to the effect of the new law make a favorable return, as a rule. In cotton piece goods the new classification causes a nominal advance of 50 per cent. Leading grocery staples are affected variously, the principal changes being an advance in sugar rates from 18 to 25 cents per 100 pounds from New York to Chicago. Hardware and cutlery suffer an advance of 5 cents. While the rate on pig iron is apparently left unchanged, the rate is actually increased, because the old tariff was not maintained. A good illustration of a nominal decline in rates

under the new law, accompanying a heavy actual increase may be found in the charges on lumber from Buffalo to New York City. Prior to April 4 the rate was 17 cents, and the rate at present is 13 cents. The point to the complaints from lumber shippers is found in the fact that the rate was cut Jan. 4 to April 4 to 5 cents. Against this figure 13 cents is a heavy advance.

As regards Boston, the principal effect of the law is the abolition of the lower rate on export grain allowed to that port, and the point will probably be laid before the commision. Many of the principal New England woolen mills are finding the cost of transporting their raw material greatly increased by the abolition of special rates, if not by the raising of public tariffs. The Pacific roads have receded from the extreme ground which they took at the outset, but even their rates on wool from San Francisco to New York or Boston are so high as to prevent overland shipments.

The Commissioners have received many dispatches protesting against the long and short haul clause. One is signed by eight principal banking houses of San Francisco. Another signed by Coleman & Co. and Castle Brothers point out that the enforcement of the fourth clause will greatly damage California vineyard, fruit and salmon interests and will drive the shipments of tea from China to the Suez route. The representatives of the wool trade send a long petition. The American Sugar Refining Co. claims that the law will entirely destroy its business in the Mississippi Valley. On the other hand, fourteen sugar refining establishments of Philadelphia and New York combine in asking to be heard in opposition to the relief of the Pacific railroads from the operation of the law. A large number of petitions have been received from theatrical people asking a suspension of the law as applied to the amusement profession. The Commission has replied that it cannot presume to determine what the policy of the railroads shall be in this regard. A long communication has been received from the executive committee of the Chicago Freight Bureau, an association composed of merchants, manufacturers and the Board of Trade of Chicago, protesting against the suspension of the long and short haul feature, excepting on Pacific Coast traffic, and that conditionally.

The Indianapolis Board of Trade has adopted a resolution to the effect that an enforcement of certain sections of the law will permanently cripple the business of the city.

The Inter-state Commerce Commission made decisions this week in regard to the petition of the Order of Railway Conductors and to that of the Trades' and Travelers' Union. The conductors propounded to the Commission a series of questions regarding the right of railroad companies, under the law, to furnish free transportation to railroad employés. The commercial travelers wished to know whether there was any reason why railroad companies should not enter into arrangements similar to those which have heretofore existed, to grant to commercial travelers an increased allowance of free baggage. The answer of the Commission to the two petitions says that the impression appears to be universal, that the Commission has power to construe and apply the law by preliminary judgment, whereas the Commission cannot do this, but must wait until some complaint is made against a common carrier.

The Grand Trunk has reduced the rate on dressed sheep from Chicago to New York from 75 to 65 per hundred pounds. Commissioner Fink is endeavoring to have the rate restored.

The New York Central & Hudson River Co. issued its circular this week recalling all passes.

The Commission has refused the petition of Decatur Axtell, Receiver of the Richmond & Alleghany Railroad, to have that road exempted from the application of the short haul provision of the law. A similar refusal has been sent to other companies which have not, in the opinion of the Commission, made a satisfactory showing of facts to support even a temporary order.

The past week saw nothing exciting in the ticket commission war between the Eastern and Western roads. Trunk line agents continue their refusal to sell through tickets over most Western roads, and agents of the Western companies sold passage orders to all who called for them. There was a report from St. Louis to the effect that the Western lines intended to make the American Ticket Brokers Association their agents. This was not believed, but it was talked about. The New York, Ontario & Western road is carrying on its immigrant business in just the way it was done before the new law went into effect. The legality of this is questioned, but there is no fuss being make about it.

The Commission made temporary orders this week suspending the fourth section of the act on the application of the Norfolk Southern Railroad Company, the Cincinnati, New Orleans & Texas Railroad as to points south of the Ohio and east of the Mississippi, and also on petition of the Texas & Pacific Railroad as to freights destined to El Paso.

The Pacific Pine Lumber Co. and the Redwood Manufacturing Co., of San Francisco, employing 8,000 to 10,000 men, have telegraphed to the Commission to the effect that their Eastern business has been entirely destroyed by the new law.

The comparative tariffs of the Southern Pacific Railroad Co. and the Canadian Pacific Co., printed in San Francisco, show that, owing to the Inter-state law, the latter company can make the rate from San Francisco to Chicago and common points much less than the former. The difference in favor of the Canadian Pacific ranges from $44 to $188 per carload, according to the class of freight.

The Chicago & Northwestern managers have announced their intention to continue paying commissions to *regular* ticket agents, drawing the line at "outsiders." The announcement calmly says that "the continuance or discontinuance of commissions is not a question of sufficient importance in itself to warrant controversy."

A large delegation of Boston men, representing the railroad and export interests of that city, was in attendance at the office of the Commission this week. Judge Soule, representing the Boston & Albany road, said that the route taken by shipments to Boston was not the same as that to New York, but was between 80 and 115 miles longer. Of course, the rates to New York were fixed by the shortest lines. A large export trade had been built up in Boston, made possible by an arrangement had with the roads which brought freight at the same rates charged by the shorter New York roads. Without this traffic, this trade would be destroyed. And that is what the present form of the law would do. George Torrey appeared for the Fitchburg Co., and showed how its wharf and elevator property in Boston would be rendered useless if the former privileges were abolished. William H. Lincoln, agent of a line of ocean steamers, emphasized the gravity of the question, saying that the who'e business of Boston was involved in the matter. Several other men, representing most important Boston interests, appeared before the Commission.

A Fashionable Name.

A charter has been issued to a company at East St. Louis, Ill., which will have the name of the Inter-state Traffic Association. The intention is to build tow boats and barges for the navigation of the upper and lower Mississippi and Illinois rivers. The capital stock of the company is $750,000. The incorporators are: E. W. Gould, John A. Scudder, Jos. Brown, James E. Munford, David R. Powell, Lucien M. Chipley and William Halleck Jones.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1887.	1886.	Inc. or Dec.	P. c.
Month of March:				
Atch., T. & S. F.	$1,735,621	$1,309,352	I. $426,269	32.5
Bur., C. R. & No.	286,875	241,943	I. 44,932	18.5
California South.	142,481	56,658	I. 85,823	151.3
Cape F. & Y. V.	22,455	20,959	I. 1,496	7.1
Central Iowa.	130,288	111,628	I. 18,660	16.7
Ches. & Ohio	340,697	338,154	I. 8,543	2.4
Eliz., Lex. & B. S.	75,154	74,284	I. 870	1.1
Ches., O. & S. W.	152,644	139,004	I. 13,640	9 8
C., St. L. & P.	475,521	384,960	I. 90,561	23.7
Cin., N. O. & T. P.	272,258	243,870	I. 28,388	11.5
Ala. Gt. South.	119,213	98,839	I. 20,374	20.6
N. Ori. & N. E.	53,845	55,928	D. 2,083	3.7
Vicks. & Mer.	42,313	40,878	I. 1,435	3.5
V., Shre. & P.	38,491	32 888	I. 5,603	17.0
Cin., R. & Ft. W.	39,959	32,196	I. 7,763	24.1
Cleve., Ak. & C.	49,584	43,987	I. 5,597	12.7
Cleve. & Mar.	29,682	22,785	I. 6 901	30.7
Cl., C., C. & I.	391,913	29.,706	I. 92,207	30.7
Col., H. V. & Tol.	225,190	176,460	I. 48,830	27.6
Dan. & Norwalk	17,500	16,966	I. 534	3.2
Den. & R. G. W.	84,800	83,868	I. 932	1.1
Des. M. & Ft. D.	28,810	31,478	D. 2,668	8.4
Det., B. C. & Al.	59,000	14.8 9	I. 24.191	162.7
Det., M. & Marq.	11,620	9.775	I. 1.845	18.8
Flint & Pere Mo.	233,446	201,677	I. 31,769	15.7
Fla. Ry. & N. Co	93,492	79,579	I. 13 913	17.4
Georgia Pacific	87,526	64,195	I. 23,331	36.3
Grand Rap. & I.	219.969	165,585	I. 51 384	31 6
Grand Trunk	1,427.181	1,240,311	I. 186,870	15.0
Gulf, Col. & S. F.	189,658	146,909	I. 42,749	28.4
Illinois Central:				
Ill Div.	579,318	496,243	I. 83,075	16.7
So. Division	349,223	324,567	I. 25,156	7.7
Ced. F. & M.	8,366	16,864	D. 8,438	50.2
Dub. & S. C.	78,550	83,206	D. 4,656	5.5
I., F. & S. C.	55,000	57,764	D. 2,764	4 7
Ind., Dec. & Spr.	39,667	28,964	I. 10,703	2.4
K. C., Ft. S. & G.	147,013	144 869	I. 2,144	1.4
K. C., Spr. & M.	11 ,448	95,7 4	I. 14,724	15.3
K. C., Clint. & S.	14,076	11,837	I. 2,239	18.9
Keokuk & West.	26 119	24,987	I. 1,132	4.5
Lehigh & Hudson.	10,915	18.367	I. 1,548	8.4
Lou., Ev. & St. L.	92,334	72,897	I. 19,457	26.6
Louis. & Nash.	1,313,445	1,104,9 0	I. 208,495	18.8
Manhattan Elev.	687,744	60., 089	I. 83,655	13.8
Marq., H. & O.	35,400	29,689	I. 5,711	19.2
Memphis & Chas.	127.948	115,171	I. 12,777	11.0
Minn. & N. W.	87,034	31,422	I. 55,612	177.1
Miss. & Tenn.	37,037	40,311	D. 3,274	8.1
Mobile & Ohio	189,465	166,152	I. 23,313	14.0
Nash., Chat. & T.	245,733	187,350	I. 58,383	31.2
Norfolk & West.	296 700	246,924	I. 49,776	20.4
Rich. & Danville:	370,000	392,514	D. 22,514	5.7
Va. Mid. Div.	114,000	113,981	I. 19	....
Chas., C. & A.	73,860	8 ,160	D. 8,300	10.1
Col. & Gr. Div.	66,200	78,527	D. 12,327	15.7
West. N. C. Div.	41,600	45,605	D. 4,005	8.7
Wa., O. & W.	8,500	7,300	I. 1,200	16.4
St. Jo. & Gd. I.	156,965	112,436	I. 24,527	21 8
Staten I'd R. T.	45,158	41,366	I. 3,792	9.1
Texas Pacific	527,224	361,053	I. 166,171	45.9
Valley (Ohio)	58,939	45,290	I. 13,649	30.1
Wab., St. L. & P.	609,797	497,427	I. 112,370	22.5
Wisconsin Cent.	190,998	131,919	I. 59,079	45.5
Min., S. C. & W.	49,046	21,377	I. 27,669	129.2
Wis & Minn.	83,623	17,495	I. 66,128	377.8
Total	$13,977,169	$11,629,364	I. $2,347,805	20.1
Month of February:				
Atlanta & Charles.	$113,739	$114,790	D. $1,051	.9
Augusta & Knox.	17.807	15,001	I. 2,806	18.7
Balt. & Potomac.	110,528	94,298	I. 16,230	17.2
*Camden & Atl.	25,894	22,935	I. 2,869	12.5
Charles & Sav.	53,704	50,577	I. 3,187	6.2
Total	$321,642	$297,601	I. $24,041	8.0
Month of January:				
Wabash, East of Miss.	$432,530	$414,880	I. $17,650	4.2
Two months to Feb. 28:				
California South.	$240,629	$73,719	I. $166 910	226.4
Net earnings	128,640	12,522	I. 116,118	929.4
Chi., Bur. & Q.	3,990,677	3,211,238	I. 779,430	24.2
Net earnings	1,711,249	1,214,797	I. 496,442	40.8
Den. & R. G. W.	142,270	127,59	I. 14,686	11.5
Net earnings	33,849	31,087	I. 2,162	6.8
Den. & R. G.	1,097,934	832,650	I. 265,284	31.8
Net earnings	402,309	218,590	I. 213,719	97.7
Mexican Central	808,583	594,457	I. 214,126	36.0
Net earnings	402,550	222,816	I. 179,734	80.6
New. N. & M. Va.	1,027,566	888,214	I. 139,352	15.6
Net earnings	254,321	237,329	I. 16,992	7.4
Ches. & Ohio	612,092	534,410	I. 77,682	14.7
Net earnings	126,757	141 964	D. 15,206	10.7
E., L. & B. S.	145,071	122,909	I. 23,162	18.8
Net earnings	32,111	30,411	I. 1.700	5.5
C., O. & S. W.	270 403	230,895	I. 39,508	17.1
Net earnings	95,452	64,954	I. 30,498	46.6
Total (gross)	$7,307,685	$5.727,868	I. $1.579,797	29.3
Total (net)	2,962 908	1,937,741	I. 1,025,167	51.4
Three months to March 31:				
Den. & R. G. W.	$1,668,732	$1,329,833	I. $338,889	25.4
Lake S. & M. So.	4,085,000	3,508.524	I. 576,473	16.4
Net earnings	1,415,000	1,296,144	I. 118,856	9.3
Four months to Feb 28:				
	1886-87.	1885-86.		
Ft. Worth & D. C.	$176,385	$127,291	I. $49,094	38 4
Net earnings	84,912	41,761	I. 42 141	100.8
Six months to March 31:				
N. Y., C. & H. R.	$17,110,607	$14,218,802	I. $2,891,805	20.3
Eight months to Feb. 28:				
Oregon R. & N.	$3,529,438	$3,755,630	D. $226,192	6.0
Net earnings	1,531,170	1,727,988	D. 196,818	11.3
Tol. & Ohio Cen.	654,358	447,475	I. 206,963	47.1
Net earnings	236,957	64,566	I. 172,391	266.8
Year to Dec. 31:				
	1886.	1885.		
Camden & Atl.	$599,091	$561,347	I. $37,744	6.7
Net earnings	129.775	124,143	I. 5,632	4.5
C., St. P., M. & O.	6,153,267	5,814,810	I. 338,457	5.7
Net earnings	2,304 692	2,093,659	I. 211,033	10.0
Ches. & Ohio	4,096,048	3,361,235	I. 734,813	21.8
Net earnings	1,118,840	895,424	I. 223,416	24.8
Col., H. Vy. & Tol.	2,361,403	2,311.003	I. 50,400	2.1
Net earnings	966,169	977,306	D. 11,137	1.1
Cumb. Valley	733,708	699,393	I. 34,315	4.9
Net earnings	196.,85	225,811	D. 29,526	13.0
Cin., N. O. & T. P.	2,882 172	2,681,547	I. 200,625	7.4
Net earnings	1,128,292	1,064,811	I. 63,481	5.9
Denver & R. G.	6,738,077	6,119,053	I. 619,024	10.1
Net earnings	2,510,660	2,183,780	I. 326,880	14.9
Norfolk & West.	3,252,056	2,771,120	I. 480,936	17.3
Net earnings	1,291,146	1,121,829	I. 169.317	15 0
St. L., B. & T.	1,544,213	1,542,879	I. 21.330	1.3
Net earnings	836,800	875,564	D. 38.764	4.4
West Jersey	1,352,458	1,286,012	I. 66,446	5.1
Net earnings	503,274	476,627	I. 26,647	5.5
Total (gross)	$29,732,493	$27,148.399	I. $2,584,094	9.5
Total (net)	10,985.933	10.038,954	I. 946,979	9.4

* And branches.

Early reports of monthly earnings are usually estimated in part, and are subject to correction by later statements.

East-bound Shipments.

The east-bound movement of flour, grain and provisions from Chicago last week shows a falling off of 12,284 tons as compared with the previous week. The total was 80,147 tons, divided as follows: Chicago & Grand Trunk, 12.0 per cent.; Lake Shore & Michigan Southern, 15.8 per cent.; Michigan Central, 11.1 per cent.; Pittsburgh, Fort Wayne & Chicago, 23.9 per cent.; Pittsburgh, Cincinnati & St. Louis, 10.0 per cent.; Baltimore & Ohio, 11.1 per cent.; New York, Chicago & St. Louis, 15.9 per cent.; Cincinnati, Indianapolis, St. Louis & Chicago, 0.2 per cent.

Cotton.

Cotton movement for the week ending April 15 is reported as below, in bales:

	1887.	1886.	Inc. or Dec.	P. c.
Interior markets:				
Receipts	11 539	22,816	D. 11,277	49.4
Shipments	24.713	46,750	D. 22,037	47.1
Stock	119,046	295,810	D. 176,764	59.7
Seaports:				
Receipts	21,627	56,305	D. 34,678	61.5
Exports	53,038	81,177	D. 28,139	34.6
Stock	476,009	756,970	D. 280 961	37.1

Total movement from plantations for the crop year ending April 15 was 6,186,199 bales, against 6,170,534 last year, 5,498,608 in 1884-85, and 5,484,475 in 1883-84.

Coal.

Coal tonnages for the week ending April 16 are reported as follows:

	1887.	1886.	Inc. or Dec.	P.c.
Anthracite	625,344	579,665	I. 45,679	7.8
Bituminous	285,167	114,497	I. 170,670	149.0
Coke (April 9)	89,305	61,942	I. 27,363	44.1

Cumberland coal shipments for the week ending April 16 were 66,778 tons, and for the year to that date, 880,424 tons, an increase of 507,317 tons as compared with the corresponding period last year.

The coal tonnage of the Pennsylvania road for the week ending April 9 was as follows:

	Coal.	Coke.	Total.	1886.
Line of road	180.078	87,363	267,441	143,201
From other lines	77,509	1,942	79,451	85,311
Total	257,587	89,305	346,892	228,512
Year to April 9	3,650,460	1,234,661	4,785,121	3,851,039

Increase for the week, 118,380 tons, or 51.8 per cent.; increase for the year, 934,082 tons, or 24.2 per cent.

ANNUAL REPORTS.

Norfolk & Western.

This company owns a line from Norfolk, Va., to Bristol, 408 miles; the City Point branch, 10 miles; the Saltville branch, 9.5 miles; the New River division, 105.5 miles; a total of 533 miles, with sidings of 96.4 miles.

The equipment consists of 103 locomotives, 58 passenger cars, 3,864 freight cars, 377 caboose and road cars.

A comparative statement of the capital account for two years is as follows:

Liabilities.	1886.	1885.
Capital stock, preferred	$18.000.000	$18.000.000
Capital stock, common	7,000,000	7,000.000
Funded debt	18,196,600	17,309,600
Car trusts	1,743,686	1,506 524
Accrued interests	338,915	306,365
Bills payable		227,620
Accounts payable (current balances)	303,897	257,134
Surplus of income	55,989	73,007
Total liabilities	$45,639.088	$44,680,251
Assets.		
Railroad property and franchises	$38,937,753	$37,720,800
Rolling stock	1,946,325	2,399,292
Car trusts	1,743 686	1,506.524
Stocks and bonds owned	1,803,300	1,758,921
Materials and supplies	232,333	124.424
Bills receivable	193,586	159,140
Suspense account	170,391	173,028
Account receivable (current balances)	277,334	570,893
Cash	260,357	267,229
Total assets	$45,639,087	$44.680,251

The funded debt includes $496,000 Norfolk & Petersburg bonds; $1,544,100 Southside bonds; $2,045,500 Virginia & Tennessee bonds; $6,752,000 general mortgage bonds; $2,000,000 New River Division bonds; $3,334,000 improvement and extension mortgage bonds; $1,500,000 adjustment mortgage; $525,000 convertible debenture and dividend scrip.

The earnings for the year were as follows:

	1886	1885	Inc or Dec.	P c.
Freight	$2,590,827	$2,138,120	I. 452,707	21.1
Passengers	486,231	458.445	I. 27,786	6.0
Mail and express	119,082	116,846	I. 2,236	1.9
Miscellaneous	55,618	57,710	D. 2,092	3.6
Total	$3,252.056	$2.771,121	I. $480.935	17.3
Expenses	1,960.909	1,649,292	I. 311,617	18.8
Net earnings	$1,291,147	$1,121,829	I. $169,318	15.0
Gross earning per mile	6,101	5,434	667	12.3
Net " " "	2,422	2,200	222	10.0
Per cent of expenses	60.2	59.5	00.7	...

The division of expenses was as follows:

Conducting transportation	686.840
Motive power	551,713
Maintenance of cars	174,716
Maintenance of way	312,586
General expenses	139.055
Taxes	95,998
Total	$1,960,909

The result of the year was as follows:

Net earnings as above		$1,291,147
Other income, interests, dividends, etc		34,303
Interest on bonds	$1,091,348	
" " car trusts	93,198	
" and discount	9,239	
Total interest charges		1,193,785
Surplus for 1886		$131,664
Surplus from previous years		73,007
Balance surplus		$204,671
Deduct extraordinary charges to income:		
Cost of extending bonds, etc	$6.107	
Charged off for change of gauge	69,894	
Repairs	72,681	
		148,682
Net surplus Dec. 31, 1886		$55,989

The traffic was as follows:

	1886.	1885	Inc. or Dec.	P. c.
Passengers carried	400,269	388,087	I. 11,702	2 0
Passenger miles	19,580,000	19,151.534	I. 428,466	2.2
Tons freight carried	1,555,867	1,199.790	I. 356,077	29.6
Ton-miles	405,008,908	295,788,872		

The average rates received were, in cents:

	1886.	1885.	Inc. or Dec.	P. c.
Per passenger mile, rate	3.122	3.027	I. 0.095	3.1
" " cost	1.943	1.777	I. 0.166	9.2
" " net	1.179	1.250	D. 0 071	5.4
Per ton-mile, rate	0.655	0.741	D. 0.086	12.2
" " cost	0.392	0.443	D. 0.051	12.7
" " net	0.263	0.298	D. 0.035	11.6